THE ELECTRONIC COMMERCE ISSUE

THE Signature SERIES

NetworkWorld

Volume 18, Number 9

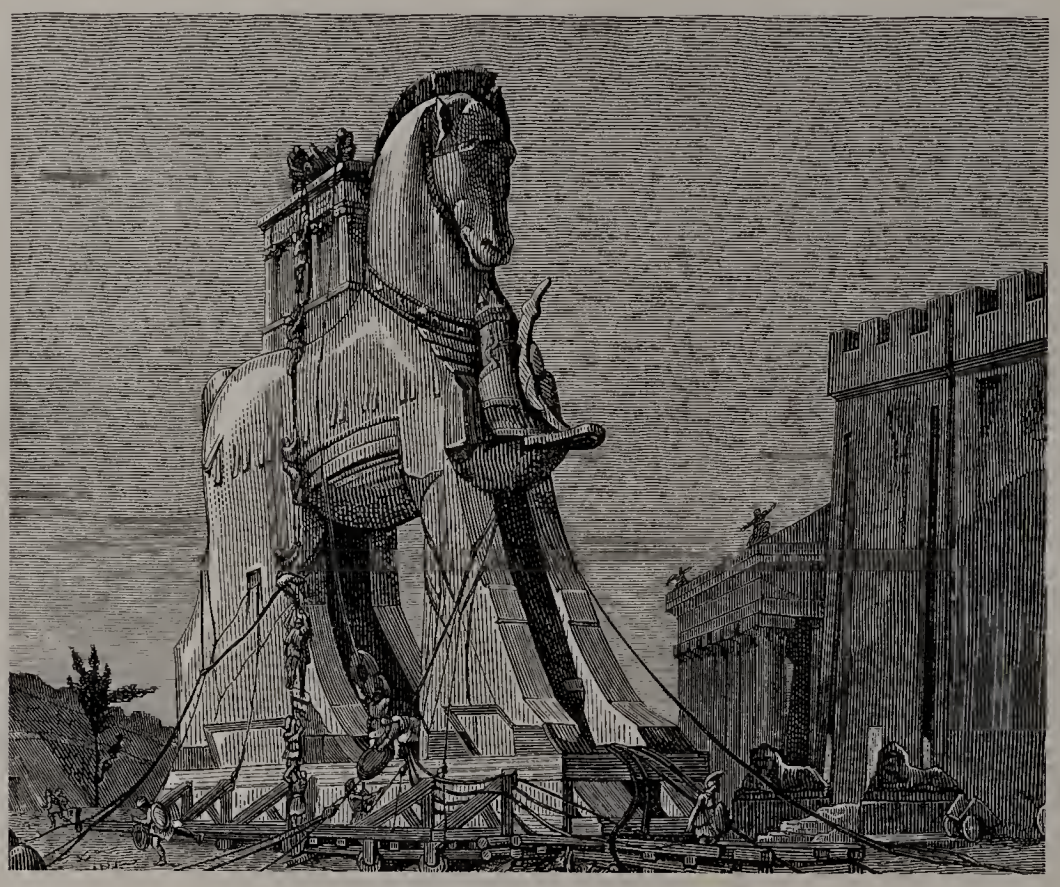
February 26, 2001

YOUR ROADMAP TO E-COMMERCE IN 2001 AND BEYOND

E-comm Innovator of the Year Award winner

M-commerce: Risks and rewards

How to extend your net to suppliers



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NetworkWorld

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M-commerce

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'Net Buzz: Silverpop has snap and crackle, but may be too sweet for some. Buzz reaches milestone with 100th column. **Page 110.**

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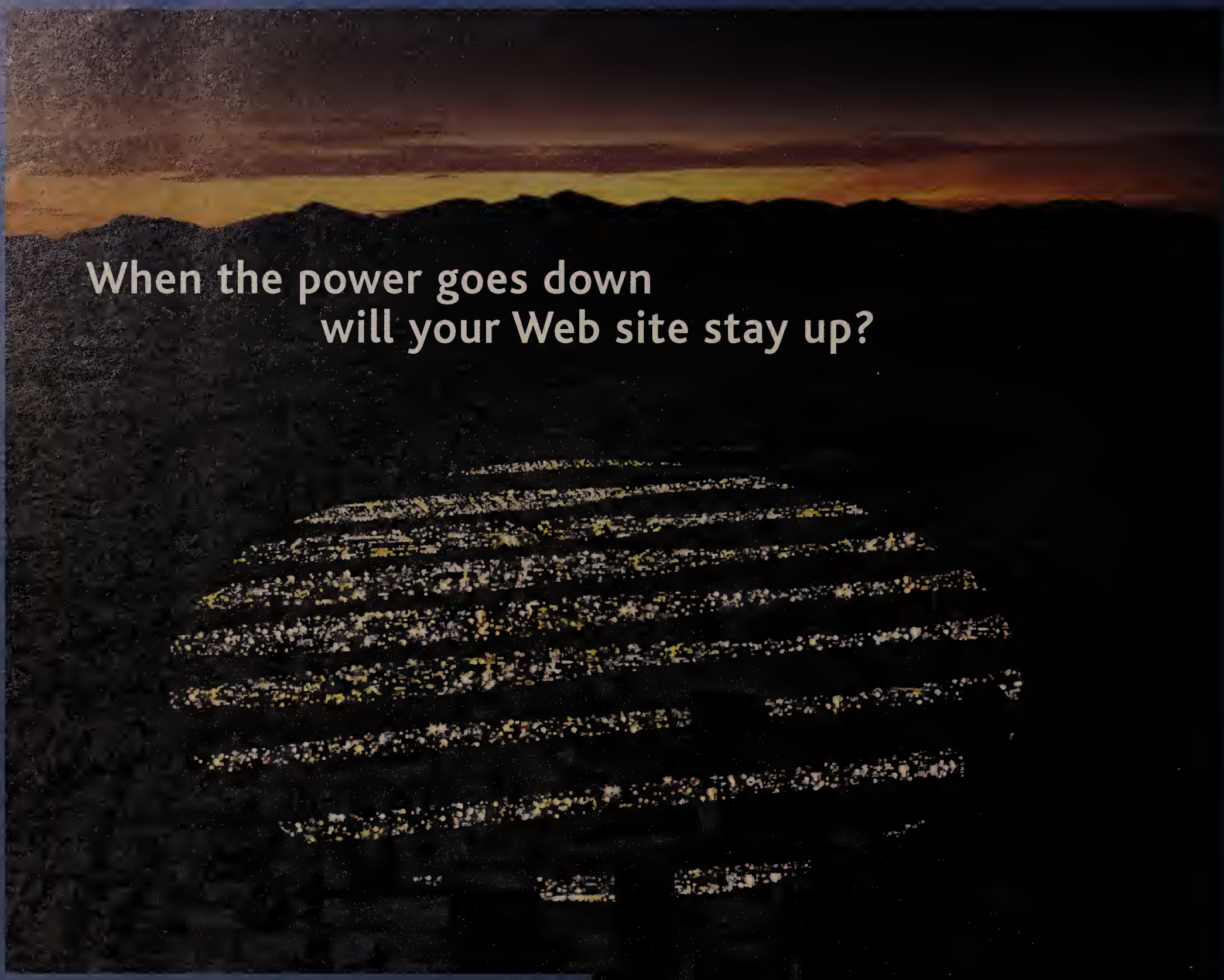

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THIS WEEK ONLINE

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INTERACTIVE

IP Multicast primer

Hear how IP Multicast works with our 5-minute audio primer written by Multimedia Editor Jason Meserve. Tune in for the pros, cons and the applications best suited for multicast. Then, check out our multicast research page for case studies, resources and more. **DocFinder: 3138**

A capital idea

Search through a year's worth of venture capital data from the *Network World*/PricewaterhouseCoopers survey. See which companies got funding from which venture capital firms. **DocFinder: 3139**

Reading Room

Enter our newest Net.Worker resource site for an ongoing list of books specifically geared to the small office, home office or remote workspace. **DocFinder: 3150**

REVIEWS

Scorecard

The Network World Global Test Alliance has given its rating of Caldera Systems' Volution, a Web-based network management system. Find out how the product fared with its performance and management features. **DocFinder: 3140**

Net Know-It-All: Play to win

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COONEY'S CORNER

The best of the NetFlash daily newsletter

Oracle's Ellison: Just trust us and everything will be OK

You have to say one thing for Oracle CEO Larry Ellison: He's rarely boring. Last week, Larry told customers attending Oracle AppsWorld to stop modifying Oracle applications and cease complementing Oracle applications with third-party software.

Hmm. Most users tweak software because it doesn't do exactly what they want. But Larry says users should just trust Oracle and depend on the company's services to do that stuff. (He didn't mention how much he'd charge for that little service and as for trust, well, few users would be willing to trust one vendor that much).

But Larry breathes rarified air, and I guess if he thinks the world would be a better place if everyone just trusted Oracle, well . . . far be it for any of us to let reality break into his fantasy.

Speaking of flights of whimsy, Larry did say if he had to start his life over, he would go into molecular biology and genetics research (he already owns a biotech research company in Israel). I don't know why, but I'm frightened by that idea. **DocFinder: 3151**

Sun warns of security hole in Java

A security vulnerability has been discovered in components of Sun's Java software, leaving some servers that run Java open to potential attack, according to a security bulletin issued by Sun and posted on the Bugtraq security list. **DocFinder: 3152**

— Michael Cooney, associate news editor

Sign up for this e-mail newsletter online. DocFinder: 3850

COLUMNISTS

Compendium

And the word is

OK, Fusion Executive Editor Adam Gaffin just can't let go of the "All your base are belong to us" chronology and he's found a term for sending lots of quick, short text messages via your wireless phone. **DocFinder: 3141**

Nutter's Help Desk

Installing DSL

Ron Nutter tells a reader to run DSL on a coaxial network for the short term. **DocFinder: 3142**

Home Base

Backing up the backlash

Net.Worker columnist Jeff Zbar advises the savvy teleworker to stay visible and deliver results on time — maybe even earlier. **DocFinder: 3143**

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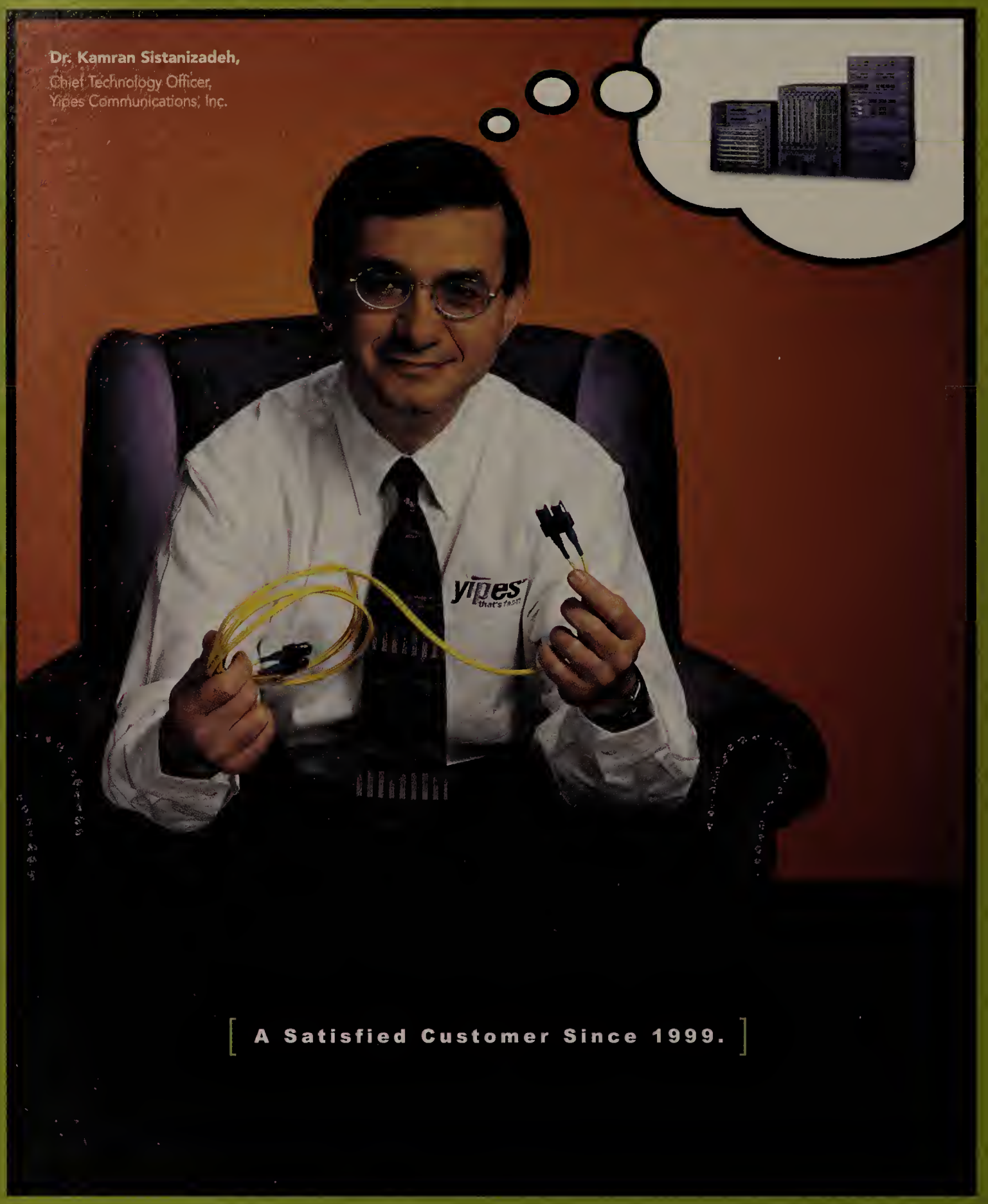

If the look on the CTO's face is any indication, Yipes Communications, Inc. is one happy camper. Yipes — the defining provider of Ethernet-based metropolitan optical networks for IP services — is offering businesses in over 20 major U.S. cities a fast, scalable and extremely affordable alternative to ATM and SONET. Because of Extreme Networks' Alpine™, BlackDiamond® and Summit® switches, Yipes can provision its customers with bandwidth on demand — from 1 Mbps to 1 Gbps — over the same strand of fiber. A powerful networking solution that's a dream come true — for everyone except the competition.

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News

Sprint refocuses on net upgrade, better services

BY MICHAEL MARTIN AND DENISE PAPPALARDO

KANSAS CITY, MO. — After spending much of 2000 sitting on its hands, waiting in vain for regulators to approve its merger with WorldCom, Sprint intends to vastly improve its network and services in 2001.

In interviews held at Sprint headquarters in Kansas City, executives outlined plans to add local voice to the provider's Integrated On-Demand Network (ION) service for corporations, prepare its PCS network for high-speed wireless services, and invest heavily in metropolitan-area and international fiber to boost its SprintLink IP backbone.

"With business [ION] we are nationwide with data, nationwide with [long-distance] voice and nowhere with local voice."

Len Lauer, president, global business market group, Sprint

Sprint has watched its main competitors — AT&T and WorldCom — split business units in an effort to combat lagging long-distance sales, bolster revenue and fight off new rivals. Sprint has remained centralized but like other providers, the nation's third-largest carrier expects data to provide a bigger boost to its revenue in the next two years. Voice accounts for more than 70% of Sprint's revenue, but that will change by 2003 when 50% of revenue is expected to come from data.

For now, Sprint has lots of lost ground to make up after its failed merger with WorldCom.

"During the merger talks, Sprint slowed investment in all its units," says Michael Smith, an analyst with consultancy Stratecast Partners. "There were probably 12 to 15 months of relative inactivity."

ION

Upgrading its ION services will be one of Sprint's primary directions this year. Introduced with great acclaim by Sprint Chairman William Esrey in 1998, ION is still neither fully integrated nor on-demand. ION was supposed to offer customers converged voice and data services over a single pipe connected to Sprint's ATM backbone.

"With business [ION], we are nationwide with data, nationwide with [long-distance] voice and nowhere with local voice," says Len Lauer, president of Sprint's global business market group. Lauer adds that about 40 enterprise customers are using ION for long-distance and data.

Enterprise customers won't be getting local voice as part of ION until later this year. Sprint is about six months behind where it thought it would be in bringing local voice into the ION package, says Fred Harris, Sprint's director of network planning and design. The delay, he says, is due to difficulties in developing a Class-5 softswitch that can offer the full set of features customers get from a traditional Class-5 voice switch, such as 911 service.

"For PBX capabilities, we need a service manager that can do [Primary Rate Interface] T-1 services," he says. "That will be coming out sometime this year."

Sprint is also behind in rolling out dynamic bandwidth allocation as part of ION. Dynamic bandwidth allocation is supposed to let customers take unused voice bandwidth and use it for data. ION users must currently set up permanent virtual circuits for their voice traffic.

The challenge will be for Sprint's sales force to convey the benefits ION could bring

See **Sprint**, page 109

AT&T, customers grapple with ATM net outage

BY DENISE PAPPALARDO

BASKING RIDGE, N.J. — Can one rogue switch buckle AT&T's ATM network?

The answer is yes.

Last week a Lucent CBX 500 Multiservice WAN Switch started a network management message firestorm that overloaded 7% of all switches on AT&T's ATM network for about four hours.

"AT&T has a lot of ATM customers and when 7% of the network is affected, most if not all see some incidental impact," says Dale McHenry, product vice president for data services at the carrier. While some users experienced network slowdowns, others were completely shut out.

According to one user who asked to remain anonymous, the network failure was significant. "The network was hosed," she says. The user's company was forced to shut down all its ATM interfaces because of problems sending Open Shortest Path First traffic over ATM.

"We had an extreme number of network management messages coming from one switch," McHenry says. This CBX 500 is one of the larger switches AT&T has deployed at its network management center in New Jersey, therefore it carries a heavy amount of network management traffic.

The SONET ring the switch was connected to experienced a fiber cut earlier that day, McHenry says. AT&T believes this was one of the events that triggered the switch to malfunction, but it may not have been the root cause.

The switch started sending out messages notifying the other ATM switches on the network that trunks were available and then unavailable over and over, he says. This is called a "thrashing SONET ring."

The switch eventually tapped its CPU power and memory, and took itself out of commission. Other ATM switches on the network then tried to reroute the first switch's traffic and subsequently became overloaded.

AT&T has spent a lot of time modeling this type of outage, and the company has contingency plans in place, McHenry says. The first step the carrier took was to remove several redundant trunks from the network. This simplifies the network so the switches that are still functioning are monitoring fewer trunks. "We have a plan on the shelf with safe trunk routes identified," he says.

AT&T re-established the majority of its switches within the first couple of hours and the last one by the four-hour mark of the outage.

Communications from AT&T after the outage didn't please everyone.

"Our company's [network operations center] did not receive the AT&T all-clear call until 6:30 a.m. [the following day]," one customer says. "It was likely that the network was restored earlier, but from a customer standpoint, we were not back on their network until morning."

All of AT&T's ATM customers should be covered by the company's standard service-level agreement (SLA), says Lisa Pierce, telecommunications analyst at Giga Information Group.

The carrier guarantees 99.99% network availability, which is equivalent to 43 minutes of allowable downtime per month. The company also guarantees traffic will be delivered round-trip within 120 milliseconds.

There are standard cell delivery SLAs that range from 99.95% to 99.99%.

"To prevent this type of event again we're looking at simplifying the trunk structure, which is a key fix as such events occur," McHenry says.

AT&T has also removed some of the network management load on switches. The company is also looking at redirecting traffic to better balance the traffic load on each ATM switch. McHenry says this should not affect customer traffic. ◪

NEWS BRIEFS, FEBRUARY 26, 2001

Nortel CTO cashes out

Nortel Networks CTO Bill Hawe left the company two weeks ago, just days before Nortel's stock plummeted in response to an earnings warning. Hawe resigned and cashed in 602,000 stock options — worth $18.4 million — on Feb. 12. Nortel stock fell 33% after the markets closed on Feb. 15 following a warning to investors that first-quarter results would be far lower than expected. Nortel, which is facing a slew of class action lawsuits after its warning, said it is not unusual for executives to exercise options once they choose to leave the company. Nortel referred inquiries on the reasons for Hawe's resignation to Hawe. Calls to Hawe's office were not returned by press time. He has been replaced by Jules Meunier, a 22-year Nortel veteran who was most recently president of the company's core network division.

Siemens to buy Efficient

Think DSL is dying? Apparently Siemens disagrees and is willing to lay down $1.5 billion to prove it. The giant international telecom equipment manufacturer plans to buy Efficient Networks, which makes DSL equipment for customer sites. The company has built its reputation on making its gear interoperable with network equipment including DSL access multiplexers made by other vendors.

Ellison to customers: 'Hands off'

Stop modifying Oracle applications. Stop complementing Oracle applications with third-party software. Stop building applications in-house. That's the message from Oracle CEO Larry Ellison. "Let us finish our software. Don't do it for us," he said during a keynote address at the Oracle AppsWorld developer's conference last week. Describing a fundamental change for Oracle's relationship with its customers, Ellison said e-business processes must become more standardized and simplified, and, to do so, customers should rely on Oracle. Ellison said Oracle's 11i applications suite lets customers use the Internet to meet 70% to 85% of their business needs without changing software code. Oracle's service crew can tweak and modify the applications to meet the rest of the customers' needs. Businesses "are better off with an 80% solution in place in six months than fantasizing about a 100% solution complete in two years after writing a lot of code," he said, referring to companies that build these applications s in-house.

AP PHOTO

Oracle's Ellison: We'll handle everything.

Microsoft, Bristol settle dispute

Microsoft and Bristol Technology last week announced they have reached a settlement in an antitrust lawsuit that alleged the software giant injured Bristol through predatory manipulation of the access to programming interfaces for Windows. Terms of the settlement were not released. Bristol had already been awarded $3.7 million in legal fees and $1 million in punitive damages during the past months based on rulings by a federal district court judge. Litigation began in August 1998.

Solaris gets a new look

Sun last week announced an update to the Solaris operating system that the company claims will increase network performance and eliminate bottlenecks. Sun Solaris 8 1/01 OE now includes features that boost performance and scalability of customers' networks by as much as 10%, the company says. The software has refined the Unix File System so that databases will operate up to 200% more efficiently and an additional memory management facility that improves system performance by 10% while allowing on-the-fly system reconfiguration. Solaris 8 1/01 OE also lets database users change memory without rebooting the system.

IETF gets first non-American leader

The Internet's premier standards-setting body has selected its first non-American as its leader. Harald Alvestrand, a Norwegian and a Cisco engineer, will take over the reins at the Internet Engineering Task Force (IETF) in March, replacing long-time chair Fred Baker, who is also a Cisco employee. "The IETF is viewed in many parts of the world as this creation of the U.S., and having a chair that's not from the U.S. is a good thing," Baker says. Alvestrand has been an active IETF participant since the early 1990s. He is an author of 21 IETF protocol documents primarily in the areas of messaging and internationalization. He is a former director of the IETF's Applications Area and a current member of the Internet Architecture Board.

Sybase gives New Era a new era

Sybase last week announced that it will buy New Era of Networks, which makes software that lets applications share data, in a stock transaction worth $373 million. The move is the latest from Sybase as it looks to expand beyond its core database business and into the broader market for Internet-related business software. Based in Denver, NEON offers a range of products for integrating business applications including enterprise resource planning, customer relationship management, supply-chain management and e-commerce applications from the likes of SAP, Siebel Systems, i2 Technologies and BroadVision.

Microsoft disputes research about Win 2000

Tests examine Win 2000 on Gigabit Ethernet.

BY JOHN FONTANA

IT executives looking to pump up the performance on their back-end systems by marrying Gigabit Ethernet and Windows 2000 may want to take another look under the operating system's hood.

A recent study by Tolly Research, the independent testing arm of the Tolly Group, found that Windows NT delivers Gigabit Ethernet throughput equal to or better than Win 2000. Tolly's finding contrasts Microsoft's testing that found Win 2000 optimized to deliver gains in Gigabit Ethernet throughput.

Some end users have taken notice of Tolly's findings, but weigh them against other issues. "I have found generally that NT throughput is a little quicker, but with Windows 2000 I can run applications like Exchange 2000," says Josh Mitts, an IT administrator at Treasure on the Net, an online gaming company.

Microsoft officials say Tolly's conclusions are not a fair comparison, citing variables such as client operating system, network adapters, LAN design, traffic-generating tools and methodologies.

But Tolly says enterprise customers looking at Gigabit Ethernet don't need to rush into Win 2000 for performance gains.

"It is a good [operating system], but have they embellished in certain areas? Definitely," says Chris Eichman, research manager for the Win 2000 track at Tolly Research. "If you are migrating [for] increased Gigabit Ethernet performance, now is not the time."

The Tolly test was a response to Microsoft tests last February that showed 1G bit/sec throughput on Win 2000 with a standard frame size of 1,518 bytes and 2G bit/sec throughput using 9,018-byte Jumbo Frames with a dual-processor/dual network interface card (NIC) setup. In contrast, Tolly was only able to record a high throughput at 837M bit/sec using Jumbo Frames and a dual-processor/dual-NIC configuration on Win 2000. The highest throughput was on NT — 842.3M bit/sec — using the same configuration.

Microsoft is urging enterprise customers to combine Gigabit Ethernet and Win 2000 to improve performance of back-end cluster and transaction servers. Gigabit Ethernet use is expected to skyrocket in the next three years. Last year, there were 4.2 million switch ports and/or NICs shipped for LAN use, according to Cahners In-Stat Group. That number is expected to roughly double every year through 2004.

Tolly says Microsoft's throughput numbers may be inflated by the NTttcp packet-blasting tool it used and by testing on a highly segmented LAN. Microsoft officials admitted their LAN had two clients per segment.

Tolly used the NTttcp tool, but also used NetIQ's application traffic simulation tool Chariot 4.0, which it says is a more real-world test.

With Chariot in a single-processor/single-NIC configuration, Win 2000 throughput was 416M bit/sec compared to 442M bit/sec for NT with standard frames, and 539.5M bit/sec using Jumbo Frames compared to 534.9M bit/sec for NT. The latter is only one of two categories in which Win 2000 outperformed NT. The other was the single-processor/single-NIC test using NTttcp and standard frames where the comparison

See **Win 2000**, page 108

RADvision rolling out software for converged IP voice, video nets

BY PHIL HOCHMUTH

MAHWAH, N.J. — RADvision next month will announce a software version of its Enhanced Communications Server aimed at companies that want to bring IP voice and video onto their data networks at the same time.

ECS is designed to let users run a converged IP voice and video network from a single PC server, instead of running separate voice and video networks. The software can run on any Windows NT-based PC server, as opposed to RADvision's embedded hardware version of ECS, which requires its own chassis and is aimed more at service provider networks.

RADvision currently ships ECS as a compact PCI module for its ViaIP chassis-based voice/video product. Cisco resells ViaIP, except for the ECS card, as part of its IP/VC 3540 videoconferencing system.

The ECS software will compete with voice and video gatekeeper products from Cisco and VCon.

The ECS software acts as an H.323 gatekeeper and provides standard call control and videoconferencing services for IP phones and conferencing units on an IP network.

According to RADvision, the server could be deployed as a video-enabled IP PBX, allowing IP phones and video stations to connect to it over a LAN. It could also be attached to a legacy PBX through a voice-over-IP gateway to connect circuit-switched voice and video users with IP users.

ECS software includes a Lightweight Directory Access Protocol (LDAP) database where end-user information and network topology data is stored. The LDAP database also allows end users to have access to third-party LDAP-enabled resources, such as e-mail and voice mail servers, through ECS.

"One thing I like is being able to get at [ECS] through a Web browser; that's a huge advantage," says Robert Bach, manager for communications services at V-SPAN. The King of Prussia, Pa., company, which provides outsourced voice and videoconferencing services to enterprise clients, has been beta testing ECS.

Bach says older voice-over-IP and video gatekeeper products he's used from RADvision have been hard to manage because a technician is required to set up the device or server.

The ability to control network voice and video policies through ECS is another nice feature of the software, he says. ECS can be used to create bandwidth policies for voice and video traffic, or for making system usage rules on an individual or group basis. Individual and group phone options are also managed this way, such as voice and video call forwarding and caller ID.

ECS could eliminate the need to have separate phone and videoconferencing systems on the same network, says Andrew Nilssen, an analyst with Wainhouse Research. This could save users money and resources, he says.

The price for a 3,000-user ECS server is around $3,000 — excluding the price for IP phones or video units. The product will be available in mid-March.

RADvision: www.radvision.com

The price is right: 10 free management tools

BY DENISE DUBIE

If the thought of paying hundreds of thousands of dollars for an enterprise net management platform is getting you down, you may be relieved to know that dozens of free management tools are at your disposal. And while you may still need to fork over big bucks for that platform, these free tools can complement commercial management software and fill other specific needs.

Take Cricket, a free network monitoring program. Rob Davies, global network architect at EDS/EBS Dealing Resources, is among the IS professionals using this program, which is essentially a much more scalable version of Multi-Router Traffic Grapher (MRTG), a popular free tool for monitoring network traffic loads. Davies is using Cricket to monitor about 1,000 Cisco routers in 40 countries on the company's private worldwide network. He also uses Cricket at a data center to monitor Sun Solaris servers as well as switch and firewall port performance.

"Cricket's very easy to configure and operate, due to the simple text-based configuration files it uses," says Davies. He adds Cricket is simpler to use than MRTG.

Most such free management tools are distributed under the GNU General Public License. This means that the programs, some of which come with "use at your own risk" warnings, are copyrighted with specific rules governing their distribution. Here are 10 free tools offered as downloads from the Internet (see graphic):

Cricket

Cricket, available for about two years, is a program created by Jeff Allen for WebTV Networks to help him see and understand the traffic on his network. Using MRTG to monitor traffic loads on network links became too unwieldy when WebTV tried to monitor more devices. So Allen developed Cricket, naming it so because Super MRTG or SMRTG just wasn't catchy enough. Plus, Cricket wasn't the same as MRTG; it just looked similar. To use Cricket, you install a bundle of modules on a server and then program them to collect network traffic data from routers. You define which routers you want to poll and schedule the frequency of the polling. You can then view network traffic trends in Web-based graphs.

Stocking your net toolbox for free

These net management programs are free over the Internet:

Tool name	What it does	Download
Cricket	Performs network and systems monitoring	http://cricket.sourceforge.net
TCPNetView	Determines IP and MAC addresses	www.eserv.ru/gorlach/netview/english.html
NetSaint	Monitors network hosts and services	http://netsaint.sourceforge.net
Qcheck	Tests network latency and availability	www.qcheck.net/index.html
Sysmon	Performs network monitoring	www.sysmon.org
Virtual Network Computing (VNC)	Lets you monitor many platforms from one console	www.uk.research.att.com/vnc/download.html
Ping Scanner	Pings multiple addresses	www.fantastica.com/digilex/downloads.html
Echo	Logs the results after pinging IP addresses	http://cbelwal.tripod.com
Sam Spade	Queries network for many tests	www.samspade.org/ssw
OpenNMS	Provides an open-source-based net management platform	www.opennms.org

TCPNetView

A private developer designed TCPNetView about three years ago to determine the IP and media access control (MAC) addresses of computers and devices on a LAN. The program's documentation compares it to Microsoft's Network Neighborhood, and it will let you know with whom you can share files and what network devices you can access. Users simply have to download TCPNetView into a working directory to run it.

NetSaint

NetSaint will monitor hosts and services, such as SMTP, Post Office Protocol 3, HTTP, Network News Transport Protocol and ping, on a network. And it can send an e-mail or page when problems arise and are resolved. It can be run as a normal process or as a daemon, intermittently performing service checks on what you've specified. NetSaint lets you monitor host resources such as processor load as well as disk and memory usage. This software has a simple plug-in design that lets you develop your own service checks. The program includes several Common Gateway Interface programs to let net managers view status information via a Web browser.

Qcheck

NetIQ's Qcheck is a utility that runs at a user's desktop and identifies performance problems, such as response time, throughput, availability and lost packets. It also runs traceroute to determine the exact path of network traffic between any two computers on a network and measures the round-trip response time. And it evaluates the network's ability to support streaming traffic, letting network managers know how many packets get lost.

Sysmon

Sysmon is for monitoring host-based services and devices, such as mail and news servers. You download the source code from an FTP server and then compile it on your system. Once you have defined what you want to test, start the daemon. From there, Sysmon runs, sending e-mail or starting external programs as necessary to notify you of network outages. Also included in the download is an HTML status page that users can customize.

Virtual Network Computing (VNC)

VNC is a remote display system that lets you view a computing desktop environment not only on the machine where it is running, but also from anywhere on the Internet and from a variety of platforms, including the Palm OS. You install a VNC server at one location and VNC viewers at other locations from which you wish to monitor systems. You must also download the VNC protocol stack that lets the server and viewer communicate. "You can remotely [administer] all kinds of boxes, from Macs to [Windows] 98 to NT to Unix, and it will run under [Secure Shell] for security if you need it," says Terry Evans, senior network specialist at Pacific Gas & Electric, a VNC user.

Ping Scanner

It's similar to, but still different from, good old ping. Whereas ping sends an echo request to let you know if one device can reach another over a network, Ping Scanner performs this task en masse. It can send requests to one address many times or many addresses one time. It performs six major functions: scans; multiscans; identifies MAC addresses on subnets; finds IP addresses; traces the same IP addresses; and queries the "whois" database for names.

Echo

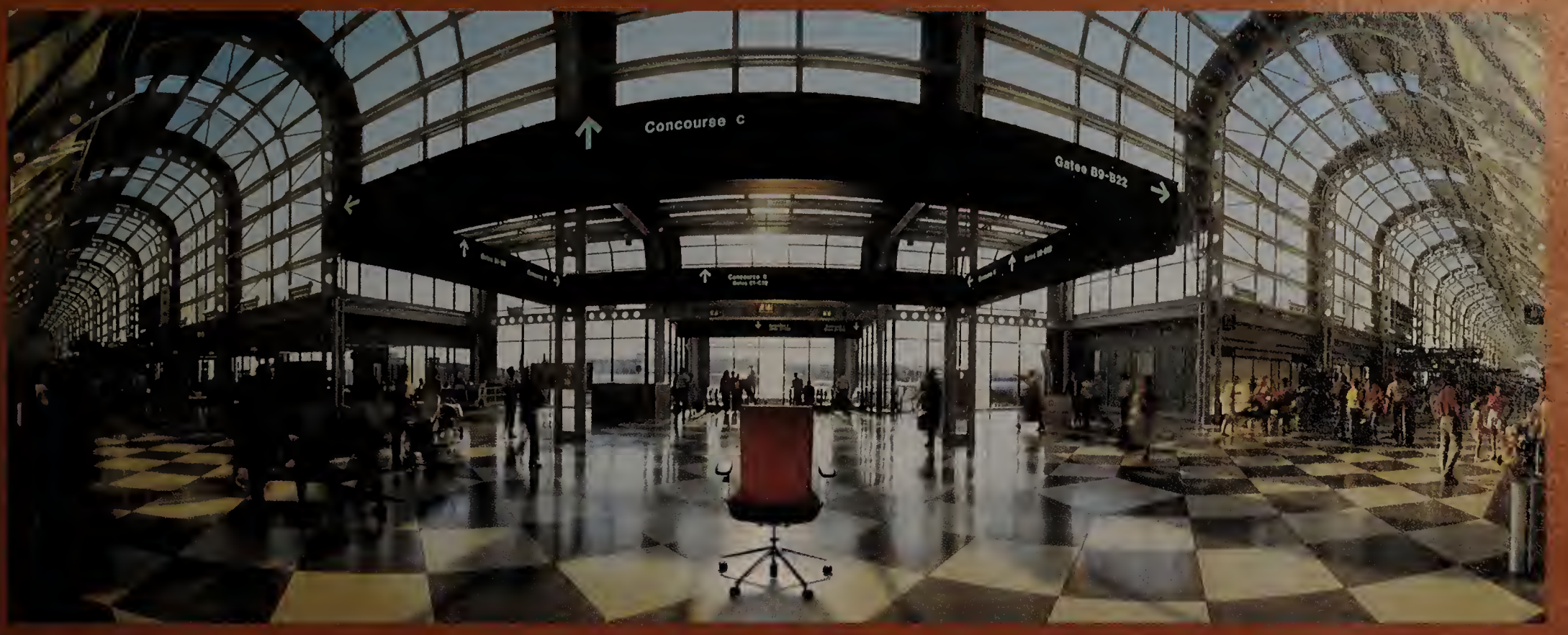
Another adaptation of a common ping program, Echo lets you log pings in a file. The program also has the ability to detect network breaks and log them. With this program, network managers can determine when the network went down, how long it was down and when it become available again.

Sam Spade

Sam Spade is a set of tools for testing different utilities in Windows environments. The tools include common ping, lookup, whois and other such query-oriented tools. You can also take advantage of dig, a more advanced Domain Name System query tool, or finger, which looks up user information on a remote Unix system. The tool set also includes a keep-alive feature that will send HTTP packets to an ISP's Web server on a scheduled basis (every minute or so) to prevent a dial-up user from losing his or her Internet connection.

OpenNMS

OpenNMS is an open source network management platform. Just download the source code, install it on a server and configure it to perform tasks. Its supporters claim OpenNMS is a complete platform, comparable to the likes of Tivoli, Hewlett-Packard OpenView or Computer Associates. Right now, OpenNMS is seeking volunteers for its Early Adopters Program. With OpenNMS, you can locate and identify devices on a TCP/IP network. And you can consolidate and store events from various other managed devices and management platforms. ◪



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Content delivery nets face peer challenge

BY APRIL JACOBS

NEW YORK — Last week's Content Delivery Networks show featured an array of hardware and software aimed at letting users speed up and manage their Web sites, but the nagging issue of how to make it easier delivering content over disparate CDNs is likely to loom for a long time.

Content delivery has become popular for many businesses looking to boost Web site performance and reliability.

Linking CDNs, a concept known as peering, promises to improve performance by giving companies' service and Web hosting firms a broader, speedier reach.

CDN services and the ability to peer those services will become more important to users, as CDN subscriptions will double over the next year, according to consultancy HTRC Group.

Ideally, users would only need to utilize one CDN provider to access multiple CDN services.

Observers agree that being able to access multiple CDN services through a single provider would be ideal for some users, but they say the hurdles are daunting.

Obstacles include not only technical issues such as making one vendor's equipment talk to another's, but political and business issues, as well. For example, some larger providers, such as Akamai — which provides content delivery services in 55 countries — might not feel compelled to peer with smaller vendors, while smaller vendors would gain tremendously at the possible expense of major companies. In addition, CDN providers must agree on sticky issues, such as compensation for using each others' service networks.

Zane Alsabery, president and CEO of Alchemy Communications, a provider of streaming and collocation services, says his company is building its own network to deliver content instead of relying on multiple providers. He says a peered network would be ideal, but he doesn't see it becoming a reality until there are enough subscribers to make it worthwhile to CDN providers.

Peering costs

Without peering, customers typically must subscribe to more than one CDN provider at a cost of about $1,400 to $2,000 per megabit per second of delivered content.

What will spur peering, he says, is a critical mass of Web surfers with broadband connections that are able to take advantage of the types of content that are bread and butter to CDNs, such as streaming and high-resolution graphics. "When people get broadband they hunt for big, fat Web pages," Alsabery says.

Jonathan Stefansky, vice president of network infrastructure at Akamai, uses an analogy to illustrate another potential problem.

If UPS and FedEx suddenly agreed to deliver each others' packages to broaden service offerings, he wonders whether customers would see the same performance from both when things got busy. Or, he asks, would a UPS customer's packages sit on the FedEx truck until all of FedEx's customers were served first?

"Conceptually [a peered network] sounds great," Stefansky says. "If it works, it's great, but is it going to be available at the breadth and depth of what we are offering [our own customers] today?"

Inktomi's Ed Haslam, chief strategist for Inktomi's network products division, echoes some of those thoughts. He says the need for CDNs has been established and characterizes the upcoming year as one when other issues will be hammered out — such as peering.

Vendors are going to have to share the wealth at some point to accommodate users' needs, he says.

Two industry alliances have been pushing the concept of content peering: Content Bridge, backed by Inktomi and others; and Content Alliance, backed by Cisco. Both have been looking for ways to peer content on disparate CDNs. Earlier this year, the two groups presented initiatives at an Internet Engineering Task Force meeting.

Exodus, Chutney, SpiderCache and others (www.nwfusion.com, DocFinder: 3148) introduced new offerings at the show as well as some additional announcements:

- Hewlett-Packard and Inktomi struck a deal for HP to resell Inktomi's cache technology. HP has an existing deal with Intel to sell its Web acceleration products — formerly under the NetStructure brand name.
- XCache released XCache 2.0, software designed to help content creators prepare different types of Web content for delivery.
- Pumpkin Networks showed off new load-balancing and switch technology aimed at content delivery. ◪

Situation looking bleak for Ventro

BY KATHLEEN OHLSON

MOUNTAIN VIEW, CALIF. — Despite Ventro's best efforts to revamp its marketplace software and services, the future appears to be dimming for the marketplace pioneer.

That's the consensus of industry experts on the heels of Ventro's announcement last week that three executives — COO Robin Abrams, CFO James Stewart and Vice President of Marketing Martha Greer — will leave the company by the end of March. Ventro, a business-to-business marketplace provider, announced the departures at the same time it issued dismal fourth-quarter and fiscal 2000 results.

Ventro reported no revenue for fiscal year 2000. Losses totaled $618.1 million for 2000, compared to $48.6 million a year ago.

"It's kind of sad over there, but I'm not surprised [Abrams and Stewart] left," says Tim Clark, an analyst at Jupiter Research. "Talented people aren't going to stick with Ventro."

Founded in 1997 as Chemdex, a life science marketplace, the company last year changed its name to Ventro and formed a parent company to run Chemdex and other industry marketplaces.

Analysts say Ventro's troubles came to a head last December when it decided to close Chemdex and Promedix, a medical products marketplace, cutting 235 jobs. Instead of continuing to run marketplaces, Ventro overhauled its business to provide software that develops marketplaces. Approximately 270 employees remain.

Lisa Williams, an analyst at The Yankee Group, blames some of Ventro's woes on Wall Street.

"Whenever a company undergoes a radical change in their business model in response to market concerns, it's like undergoing a heart transplant — you're not going to get well right away," she says.

One Ventro user sees a silver lining in the company's troubles.

"[Ventro] is going through a transition, and you need to expect this kind of stuff," says Charlie Waters, an Industria Solutions executive. Ventro's situation "is good for us because they'll concentrate on us."

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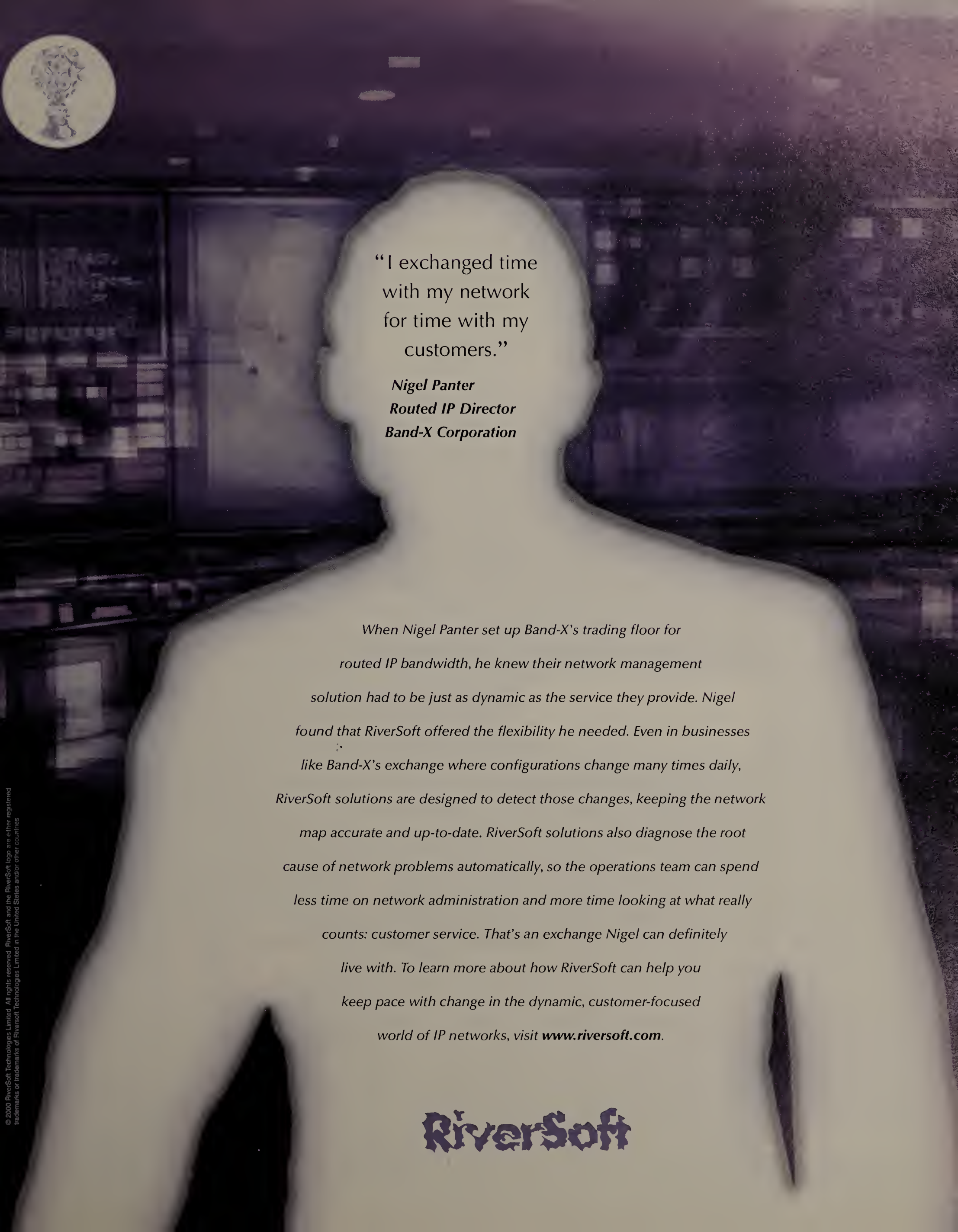


When Nigel Panter set up Band-X's trading floor for routed IP bandwidth, he knew their network management solution had to be just as dynamic as the service they provide. Nigel found that RiverSoft offered the flexibility he needed. Even in businesses like Band-X's exchange where configurations change many times daily, RiverSoft solutions are designed to detect those changes, keeping the network map accurate and up-to-date. RiverSoft solutions also diagnose the root cause of network problems automatically, so the operations team can spend less time on network administration and more time looking at what really counts: customer service. That's an exchange Nigel can definitely live with. To learn more about how RiverSoft can help you keep pace with change in the dynamic, customer-focused world of IP networks, visit ***www.riversoft.com****.*

RiverSoft

E-mail encryption guru focuses on PGP's future

BY ELLEN MESSMER

DUBLIN, IRELAND — The inventor of Pretty Good Privacy e-mail encryption last week left Network Associates, Inc. — the company he joined after selling it the rights to PGP in 1997 — to become chief cryptographer at a company planning to do battle with NAI.

Phil Zimmermann, who fought the U.S. Department of Justice in the early 1990s to help win freer use of e-mail encryption, says he is no longer confident that NAI will develop PGP the way he thinks best.

Rather, he sees the future of PGP at Hush, an Irish firm that later this year plans to release a version of its HushMail product based on the IETF's Open PGP standard.

NAI markets a commercial version of PGP, which comes bundled with antivirus, intrusion-detection and firewall capabilities, but also makes a freeware version available on its Web site. There are uncounted numbers of PGP freeware users around the world, and NAI provides a certificate server for users to store their PGP public keys for free. It now holds more than one million PGP certificates.

He expressed concern that PGP's freeware future may be in doubt, pointing to the fact that NAI last month refused to publish the source code for the latest version, PGP 7.0.3, as it has done for all previous versions. Zimmermann, who had been a consultant at NAI, says PGP 7.0.3 contains no secret back doors — at least to his knowledge — but he adds that the open source process would help assure the masses on that score.

Phil Zimmermann, inventor of PGP, plans to develop new secure e-mail products at Hush Communications.

Sandra England, president of NAI's PGP Security business, counters that there will never be back doors in PGP. She says the company had not gotten around to posting the source code, though she offered no date when it might. England adds that NAI has no plans to discontinue PGP freeware or its free certificate storage.

"NAI has a different vision for PGP's future," says Zimmermann, who says he will safeguard PGP freeware at Hush.

For its part, the privately held Hush, which also has offices in the U.S., says it offers freeware, but has moved aggressively into the commercial market with a product called HushMail Private Label. The next version, expected around midyear, will be based on Open PGP. Zimmermann says his job will be to oversee HushMail Open PGP, and to ensure it works with NAI's PGP — with which it also will compete.

According to Zimmermann, HushMail Open PGP will be quite different in that it will use technology that delivers an authenticated user's private key to a Web browser — via a Java applet — from a HushMail Open PGP server (see graphic). This will enable end users to access encrypted mail from any desktop with a Java-enabled Web browser. By contrast, NAI's PGP requires users to store their private keys on their desktops, limiting end-user access while away from the office. Hush is also negotiating with a company called Veridis to store public-key certificates in the same way NAI does.

"The disadvantage with PGP is that you have to install encryption software on every computer," Zimmermann says. "With HushMail, you won't."

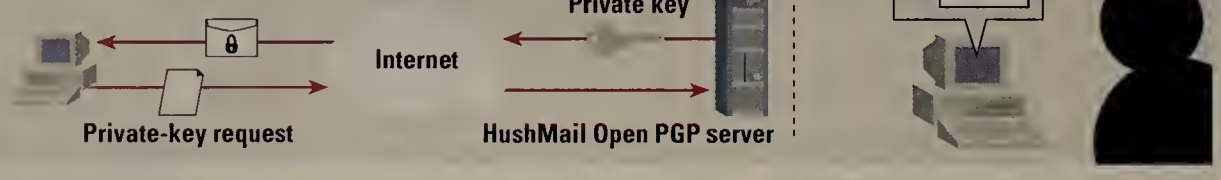
Though NAI and Hush will go head-to-head, England says it's possible that NAI would consider adopting Hush's applet approach.

But with NAI struggling financially of late, England acknowledges her division doesn't have the same level of funding it did a year ago to add new features to the PGP division's products, which includes PGP, the CyberCop intrusion-detection product, and the Gauntlet firewall. ◪

On the hush-hush

How HushMail Open PGP will work:

1. An end user receives e-mail encrypted via HushMail Open PGP. The user then employs a Java-enabled Web browser to request his or her private key from a HushMail Open PGP server.
2. The HushMail Open PGP server delivers the key to the end user as part of an applet.
3. The end user decrypts the message with the key, which disappears when the user logs off.



Syncing handhelds to corporate data wirelessly isn't easy

BY JOHN COX

NEW YORK — The benefits of synchronizing data over wireless networks between handheld users and corporate networks promise to be great, but observers say the complexities and problems inherent in reconciling databases and applications in such environments may be even greater.

The benefits of synchronization can include pushing pricing, inventory and other fresh corporate data out to mobile users, updating corporate applications with data collected in the field, and providing end users with faster data response times by enabling them to store updated data on their mobile devices.

But enthusiasm for such benefits is tempered by concerns that wireless links are slow, prone to glitches and expensive. IT groups also have to resolve tough issues such as who's responsible for data and the changes to it; how to reconcile changes to data stores; how to juggle data structures in different applications; and how to design applications for low-storage, low-bandwidth handheld devices.

"It's inherently more complicated than accessing data on one central server," says Andy Kasznay, software engineer with Northeast Utilities in Berlin, Conn. "But our business requires it."

The utility uses database replication technology from Sybase's iAnywhere Solutions and a mobile message queuing system from Broadbeam to send data to about 200 field electricians and environmental coordinators.

Mobile data synchronization was a hot topic last week at Internet World Wireless, where Alan Kessler, COO of platform and products for Palm, delivered a keynote address. During his speech, he outlined a number of steps the company is taking to make its PDAs more viable on wireless networks. Among other things, the company is creating a synchronization link, apparently based on software from recent acquisition WeSync, that will let Palm's newly unveiled MyPalm portal act as a clearinghouse for pushing data changes out to all Palm devices authorized to share contact, calendar and e-mail information.

"A change to [data on] any Palm device will be synchronized with all other authorized Palm devices linked to the portal," he said.

"Most handheld computers today are glorified Day-Timers, and most of them are tied to a desktop computer or a laptop," says Bill Jones, vice president of product management with Synchrologic, one of several synchronization vendors exhibiting at the show. "How can we harness the raw computing power of the enterprise [for these devices]?"

In stages, he says, by first synchronizing personal information, such as contacts, schedules

See **Sync**, page 108

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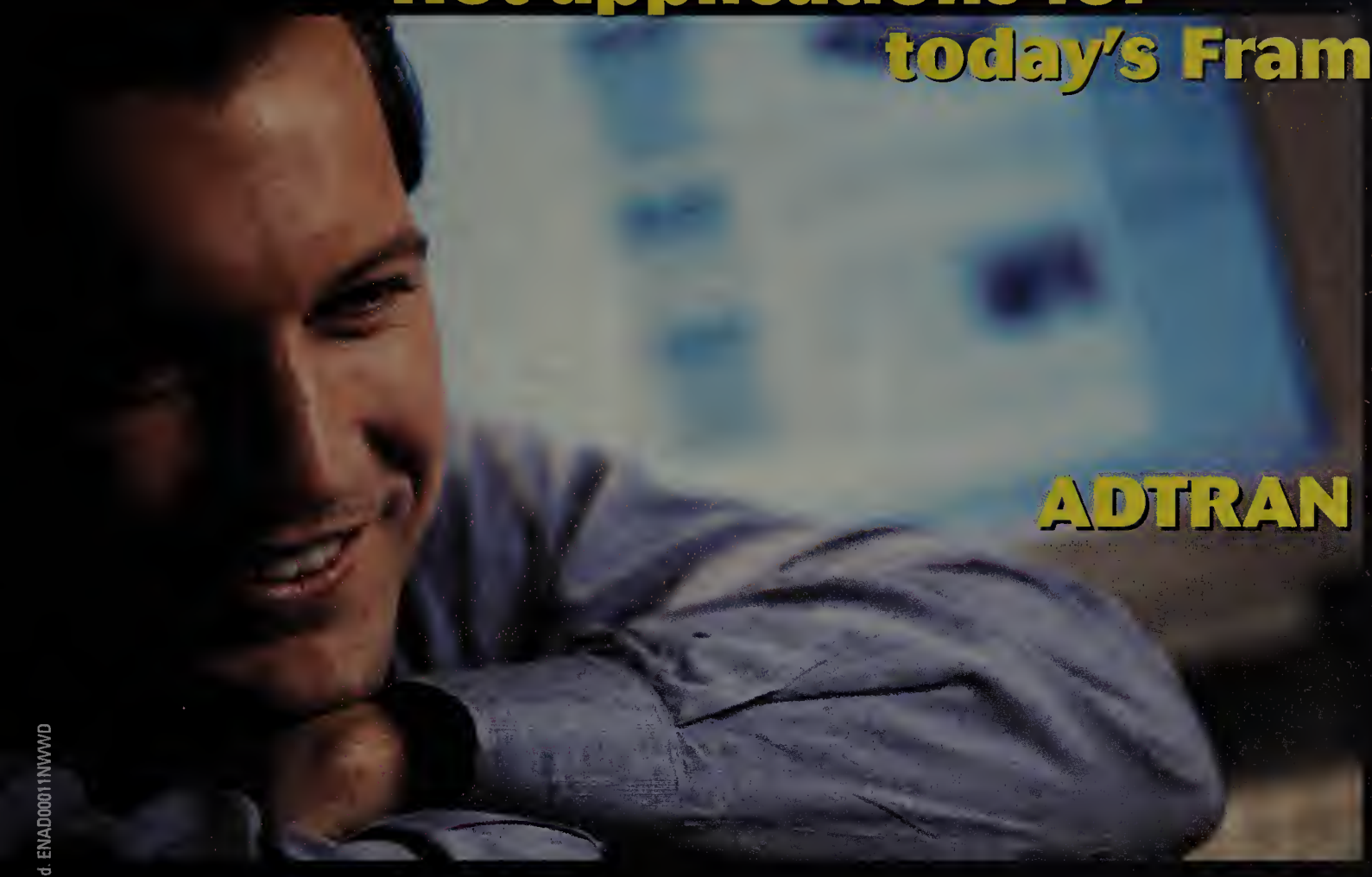

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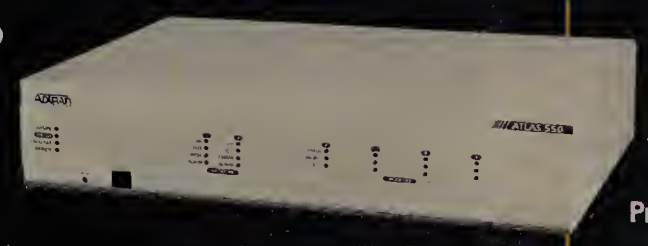

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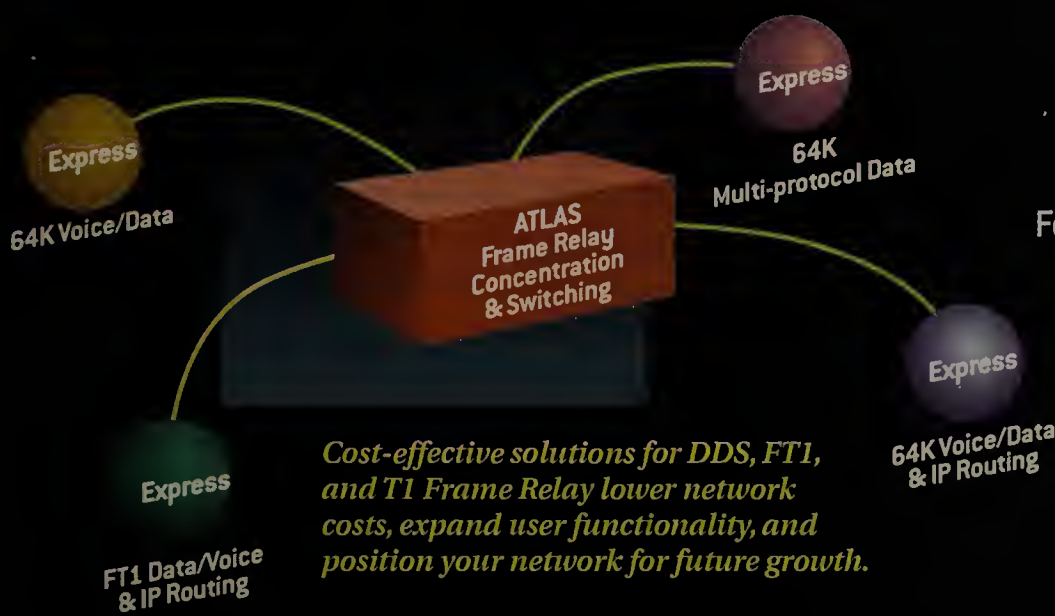

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VPN vendors teaming with security partners

BY TIM GREENE

SAN JOSE — Anxious to become more than just makers of VPN equipment, a number of vendors at the VPNCon show in San Jose last week announced they are teaming to offer more comprehensive security packages.

While some are adding features such as digital certificates to their VPN equipment, others are installing management capabilities that make it easier for service providers to deploy their gear.

"I think what you see is a maturation of VPN product lines, and, in particular, vendors are beginning to understand the needs of enterprises," says Joel Snyder, a senior partner at OpusOne, a technology testing firm in Tucson, Ariz.

SonicWall says it now includes VeriSign digital certificate capabilities with its VPN appliances. Network administrators will be able to download an administrative digital certificate and issue user certificates to individual end-user PCs.

The new alliance is a way for SonicWall to quickly pack its devices with more features in a single interoperable bundle, says Dave Dorosin, director of product management for SonicWall. "We're not just a VPN device. We're trying to position ourselves as a security platform," he says.

VPNs soaring

Worldwide sales of VPN software hit $1.1 billion in 2000, a 121% increase over 1999.

SOURCE: INFONETICS

Meanwhile, Eicon Networks says it is reaching out to vendors of IP Security (IPSec) PC client software. Eicon's upcoming SafePipe 30 branch office VPN appliance will support any IPSec VPN client as long as these other clients are certified by the International Computer Security Association, the company says. The new device will support the VPN client that comes with Windows 2000 PC operating systems.

SafePipe 30 will be introduced in June. The SafePipe 5000 will be introduced later this month and will support 20M bit/sec VPN throughput for large corporate sites. Prices have not been set.

Meanwhile, NetScreen Technologies is taking a different tack by teaming with service provider OneSecure to provide a managed and easy-to-install VPN service.

NetScreen makes VPN appliances that include firewalls and traffic-shaping capabilities, while OneSecure is a security services provider that offers managed firewall and VPN services.

NetScreen says it will install OneSecure's software security agent in the operating system of all its equipment, meaning it can be managed via One-

See **VPN**, page 109

Storage giants evolve products toward open systems

IBM and EMC roll out software and hardware that promise to work with multivendor systems.

BY DENI CONNOR

Network professionals may be able to more easily mix and match storage products if rivals IBM and EMC deliver on promises made last week.

EMC rolled out software that can manage not only its Symmetrix arrays, but also high-end storage from Compaq, Hewlett-Packard, Hitachi and Storagetek. Although Symmetrix accounts for one in four external storage boxes installed, many EMC customers have other storage they want to manage from the same interface, the company says.

IBM introduced a network-attached storage (NAS) appliance and an IP storage device that lets users route SCSI storage data over Ethernet networks.

Together, EMC and IBM account for almost 40% of the storage-area network (SAN) market, according to market research firm IDC, with EMC logging about three-quarters of that slice.

EMC announced that its ESN Manager software can now manage the access and assignment of servers to storage volumes for high-end Compaq Storageworks MA8000, Hitachi Data Systems Freedom 7700 and 9900 and HP SureStore XP256 and XP512 arrays, as well as Storagetek 9840 tape systems.

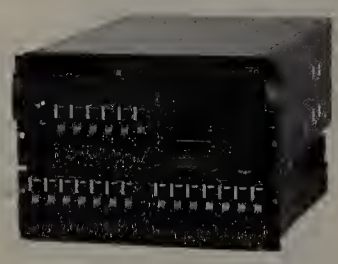
"One of the problems today is that you have to use independent graphical interfaces to perform an activity such as zoning," says Hemant Kurande, CTO at managed storage provider Storability in Southborough, Mass.

"As the first enterprise storage management [product to] support multiple open systems vendors, this product will set the bar for other vendors," says Tony Prigmore, an analyst at ESG.

IBM's open systems approach is similar to that of EMC: Make sure its storage works with any number of protocols, products and operating systems.

New IBM storage device

IBM's TotalStorage IP Storage 200i routes storage data over existing Ethernet networks in conformance to the IP storage specification.



Features include:

- First device that conforms to upcoming IP storage (iSCSI) specification
- Works over existing 10/100M bit/sec networks
- 216G bytes to more than 1.7 terabytes storage capacity
- Runs on Linux, Windows NT/2000 networks
- Single and four RAID channel versions
- Single and dual Pentium processors

Zoning lets virtual private storage networks be assigned to individual servers.

"Some vendors do zoning at the host, at the Fibre Channel [switch] or at storage subsystem level," Kurande says. "ESN lets us make changes everywhere with one interface." Storability has customers that have EMC, Compaq and other storage equipment.

Industry analysts are praising the EMC move.

Its IBM TotalStorage Networked Attached Storage 300G straddles the NAS and SAN markets, much like EMC's Celerra NAS and Highroad software do. Like Celerra, the IBM 300G is headless — it sits ahead of external Fibre Channel storage and routes Microsoft Common Internet File System, Unix Network File System, Novell NetWare Core Protocol, FTP and HTTP data over the network.

To a client workstation or server on the network, the 300G looks like NAS. The 300G connects to IBM's Enterprise Storage Server (commonly called Shark), the IBM Modular Storage Server and IBM 7133. When the 300G is used with Tivoli's SANergy software, data can be routed over either the network or the SAN, whichever is most efficient.

Another IBM product, the TotalStorage IP Storage 200i, provides departments, workgroups and midrange customers with an alternative to expensive, difficult-to-implement Fibre Channel storage. The 200i works over existing 10/100/1000M bit/sec Ethernet networks and uses a server-based software driver to route SCSI data encapsulated in IP packets to the 200i, where the data is unencapsulated for delivery to the storage device.

The 200i is the first storage device on the market to use iSCSI, a protocol draft submitted by IBM and Cisco to the Internet Engineering Task Force.

The 200i is available in two models — a Pentium III Model 100 with 216G bytes of storage capacity and a single RAID channel, and a dual-processor model with more than 1.7 terabytes of data capacity and four RAID channels. Both work on Windows NT/2000 and Linux networks.

Even though users appear to want to use familiar IP networks to transport storage, data is particularly sensitive to errors in sequencing and delivery, traditionally necessitating the use of Fibre Channel security and flow control.

The iSCSI draft proposes using TCP as the mechanism that guarantees appropriate delivery.

A variety of vendors are creating IP storage devices.

Cisco will announce a storage router called the 5420 that uses iSCSI as soon as April. Intel will deliver software drivers for its Ethernet adapters that support iSCSI, sources say. EMC has not announced plans for iSCSI.

ESN Manager starts at $24,000 and is available now. The IBM 300G starts at $44,000 and will be available in March; the 200i will be available in June starting at $20,000. ◪


You think
your company's
online.
But it's not.

The bridge between the paper world and

Your investment in IT infrastructure is huge. And the impact of the Internet on your IT budget grows larger every day. You've poured tons of resources into ERP systems as well as e-mail and document workflow systems. How much? Well, studies show that as much as 50% of an average IT budget can be involved with managing documents.

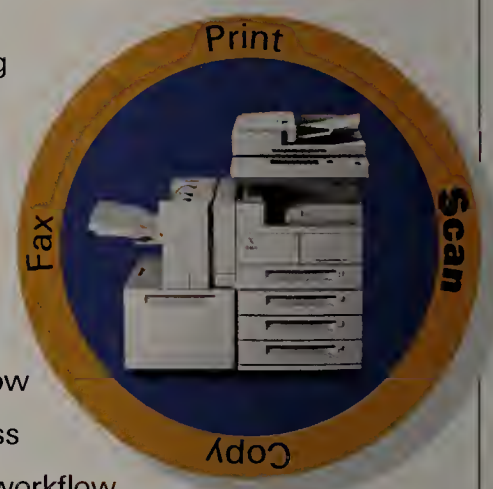
❑ True, there are more documents online than ever before. But it's also true that we are creating more paper documents than ever before: twice as many as just five years ago. The reason is simple: Most companies have lots of off-ramps that turn electronic documents into paper documents, but almost no one has lots of on-ramps capable of converting paper documents into electronic ones.

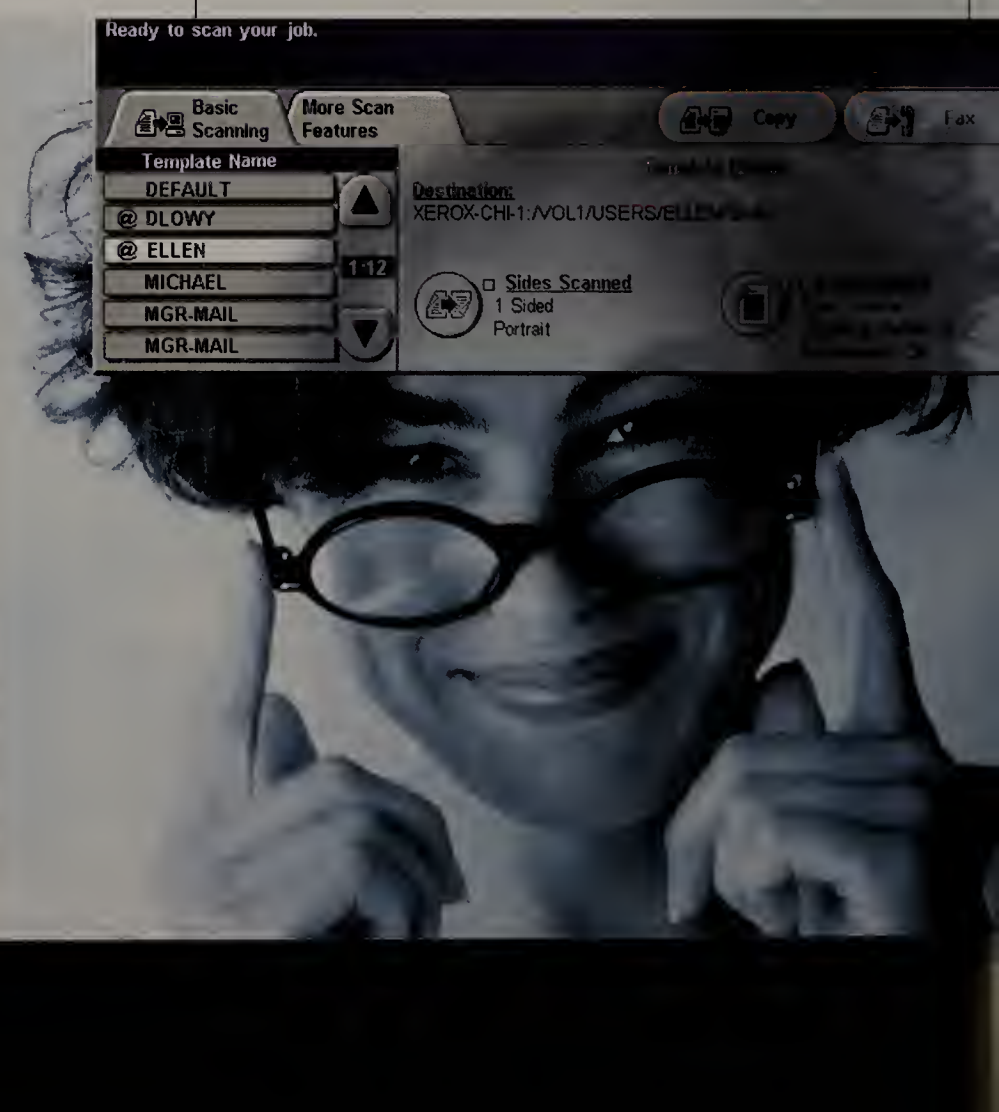
❑ In fact, giving you new ways to leverage your IT investment by bridging the frustrating gap between the paper world and the electronic world is exactly what the Xerox Document Centre system was designed to do.

It's about document imaging for every workgroup.

If scanning is on your radar at all, you probably see it as limited to environments with dedicated operators. And so it has been. But the Document Centre system is changing that in big ways.

❑ For starters, a Document Centre lets people work the way they are used to working—you can scan documents in the same place you print or copy them—it's that easy and that accessible. Of course, the Document Centre gives workgroups of 10 or more desktop control over everyday functions like printing, copying, PC faxing and finishing. What's more, by making document imaging an "everyday" function, the knowledge and information recorded in paper documents can now become a seamless part of the digital workflow.





the online world is now open for business.

Scan directly to the Web or virtually anywhere else you want to.

Going out to the hallway and scanning large documents into the digital stream at up to 65 ppm is certainly efficient, but the important question remains: Where is all that information going, and what can you do with it once it gets there?

❑ Document Centre lets you scan directly to industry-standard messaging and collaboration platforms like Microsoft Exchange, Lotus Notes or Domino.Doc.

❑ You can scan directly to a Web repository, so anyone has instant access to information from a remote location.

❑ Scan to your PC desktop, and with ScanSoft PaperPort and TextBridge software bundled with Document Centre, you can drag and drop your scanned image into any one of 150 industry-standard applications. You won't need to re-key your documents.

Scan 65 ppm

3 easy steps

1 Select scan folder
2 Select destination
3 Press green button

OPEN ARCHITECTURE SYSTEMS

Microsoft
Windows NT 4.0 & 2000
Appletalk
Novell NetWare 4.X
PCL 6
Token Ring 14/16MB
TCP/IP
OS/2 WarpServer
Ethernet 10/100
Adobe PostScript 3

❑ Or scan documents to the network, and using software like Xerox DocuShare, users can access them through any current Web browser on any platform. It gives you an electronic file cabinet that's a very efficient way to share knowledge and dramatically reduces e-mail traffic.

❑ Or combine Document Centre with Xerox FlowPort. FlowPort is a Web-based software platform that manages the flow of documents from paper to digital and back again in dramatically new ways. For example, FlowPort gives mobile workers the freedom to access and print any documents on the Web without using a PC.

The Web
Microsoft Exchange Public Folders
Lotus Notes
Xerox DocuShare
Lotus Domino.Doc
PC Desktop

❑ And when it comes to getting your digital documents back into paper form, Document Centre's open architecture supports all major industry printing standards and encourages third-party software solutions to thrive. So you can print not only from your desktop or from the Web, but also directly from your mainframe, including ERP applications like SAP.

❑ In short, things once limited to paper are electronically archived, accessed, shared and easily printed wherever you need them. It doesn't just increase productivity, it decreases costs and saves time. Turn the page to learn how one of our customers is already benefiting.

Paper or digital, it's about solutions that leverage the network.

We have hundreds of customers who report impressive results. But here's one in-depth story of how a Document Centre solution reduced one organization's work-cycle time from three days to just three minutes.

The Customer:

Center for Technology Management, in a prominent Midwestern research institute.

The Problem:

There are dozens of huge file cabinets overflowing with documents—patents, notes and contracts about inventions the university owns. Each year up to 1,500 new folders are added. Every day, dozens of people call and request files. By law, the university must provide public access to any of these thousands of complex scientific documents for reference, revision, notation or collaboration. And it must be done for 25 years. The commitment of time, space and personnel is large and growing.

The Solution:

Combine Xerox FlowPort and DocuShare with two Document Centres. This gives you a search engine for all your documents.

Now when people need a document, they just check off the file they need on a FlowPort cover sheet, scan it into the Document Centre, and FlowPort software finds and sends the requested electronic file to a server that can print, e-mail or store the document. What's more, once the file is stored, DocuShare lets you manage it on the Web, giving authorized users instant access for viewing, downloading and printing documents from anywhere at any time.

The Result:

A process that used to take three days can now be completed instantaneously. Documents are accessed and shared electronically. Paper is eliminated while collaborative work processes are made simpler. Security is improved. Those 20 file cabinets are soon history. Costs are lowered. Time is saved.

Online or off, it's about a simpler way to share knowledge.

In a world of intranets and extranets, of e-commerce and the Internet, you need state-of-the-art technology and expertise to manage and share the documents that contain the knowledge in your organization. The Xerox Document Centre is a digital platform engineered from the ground up to eliminate the barriers between your paper and online documents.
Call us or visit our Web site for more information. And see how much you can increase productivity and control cost just by getting all your company's documents online.

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Infrastructure

TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices, Clients, Servers, Operating Systems, VPNs, Networked Storage

Briefs

Network infrastructure vendor **SMC Networks** has rolled out a new file server/Internet appliance for enterprise branch-office and departmental use, as well as small and midsize businesses. The Barricade Broadband Storage Server includes 20G bytes of storage, a seven-port 10/100M bit/sec switch, a broadband router for Internet access, a print server and firewall software. It works in PC and Macintosh environments. Available now, the Barricade costs $850.

SMC Networks: ww.smc.com

VA Linux Systems accompanied disappointing second-quarter financial results last week with the news that it would reduce its workforce by 140 employees. VA Linux builds servers for corporate customers using the Linux operating system. While the company increased revenue 11% year-over-year to $42.5 million, it had an operating loss of $13.3 million for the second quarter. The firm said the cuts would save it $5 million per quarter.

VA Linux Systems: www.valinux.com

Wireless users may soon see improved video quality on their handheld and mobile devices with the new release of PVPlatform 2.0 from **PacketVideo**. Announced last week, PVPlatform combines authoring, server and player software for creating video for wireless devices such as cell phones or PDAs. Version 2.0 has support for the MPEG-4 audio/video format, which is designed to be used over a broader array of bandwidths than previous versions of MPEG. PacketVideo says it is working with major cellular phone chipset providers to embed the PVPlatform technology into silicon.

PacketVideo: www.packetvideo.com

Volera exec talks up caching, content

NetworkWorld Q&A

Earlier this month, Novell spun off Volera to handle its Internet Caching System and Content Exchange products. Network World *Senior Editor Deni Connor spoke to Simon Khalaf, president of Volera, about the company and where it is going.*

What are the goals of Volera from a product standpoint, and what type of new products might we see?

We are going after the content networking space, which includes caching, content distribution, intelligent switching and content management. Our specific products and solutions will be focused on caching, content distribution and content management. You are going to see products in the next six months in the content management space [with] the ability to distribute and promote content to a distributed caching system. Promotion means pushing content ahead of other content.

How does your strategy for addressing the caching and content distribution arena differ from your competitors?

If you look at the market, you have caching, content distribution and content networking, which is the ability to build end-to-end solutions for content distribution. [In caching], we see Inktomi and CacheFlow as competitors in the U.S. and Network Appliance in Europe. Our strategy is very simple — it is distribution. Get the product to the OEMs and commoditize it. We have 11 OEMs. It is very tough for a direct salesforce to compete with thousands and thousands of salespeople.

In the content distribution area, we have teamed up with Akamai and MirrorImage. Our content distribution product [Content Exchange] is unique. We've set up distribution for it through GlobalCenter. That is a strong differentiator to us against CacheFlow. If you look at Inktomi, it has a play in this space through the Content [Bridge] Alliance. The Content [Bridge] Alliance is faltering since Inktomi had to step in and acquire the assets of Adero.

In the content networking space, our relationship with Nortel is a strong differentiator and so is the product suite we are coming out with in the next six months that can handle the distribution of content across geographically distant networks.

Is the audience for Volera's products the service provider or the large enterprise?

Both. We are seeing a lot of growth in the enterprise. Enterprises are building their own content distribution networks on the Internet and that's who we are going after with the OEM channel. The second market is the content publishers; we are going after them through the Web hosting facilities. The third market is large carrier-class service providers, such as AT&T, WorldCom, Sprint. And we are going after this market with Nortel.

You are going to release two add-on products, Media Excelerator and Secure Excelerator, to your Excelerator caching family (formerly the Internet Caching System) in the next few months. What other applications will Volera develop?

The products that are coming from Vol-

See **Volera**, page 23

Foundry's software eases switch management

IronView II offers access control, configuration management support.

BY PHIL HOCHMUTH

SAN JOSE — Foundry Networks this week will introduce software for running and managing its switch family, as well as a new gigabit module for tying switches to a corporate backbone.

Foundry's IronView II software is intended to let Foundry switch users more easily manage their switch configurations. The product is Foundry's first comprehensive management tool for its switches, which, one analyst says, has been a long time coming.

The IronView II software is a set of management tools for virtual LANs, access control lists (ACL), switch management and configuration, as well as an event manager. The software lets users group configurations of switches through a drag-and-drop Web interface.

New firmware

By using IronView II's ACL manager in conjunction with the new firmware on Foundry's switches, network managers can use ACLs to manage user access to network resources and software at Layer 2 wiring closet switches, says Val Oliva, Foundry's Layer 2/Layer 3 product manager.

"Normally, you need a router to do access control lists," Oliva says. The new firmware allows Layer 2 switches to

See **Foundry**, page 22

WORLDCOM

WorldCom Security Specialist

CHRISWIREMAN

favorite expression:
no trespassing

favorite technology:
virtual private networks

favorite architecture:
great wall of china

Chris Wireman lives by the code, "better safe than sorry." So it probably comes as no surprise that he installs WorldCom's IP VPN Services all over the world.

After all, we own and operate one of the world's largest IP infrastructures. Which lets us give our customers the reach and efficiency of a public network with the performance and security of a private network.

The reason is simple. The traffic never leaves our network. So you not only get safe access to your Intranet, Extranet, Data Centers, Remote Users and the World Wide Web. You get consistent performance, too.

But that just scratches the surface. Because we also employ the kind of encryption, tunneling and firewall technologies that keep your data secure and virtually hacker-proof.

We can even integrate our IP VPN Services with existing private networks that run on Frame Relay or ATM.

All of which should prove no one is more qualified to privatize the public Internet than us.

Want to know more about Chris's favorite technology?

Don't worry. It's not a secret. Just visit us at www.worldcom.com

generation d

Foundry,
continued from page 19

interpret ACL information sent from an IronView II server and apply the corresponding rules to users attached to the switch. Enforcing ACLs at the wiring closet instead of a core router of backbone switch can ease backbone congestion, Oliva says. Users also don't have to upgrade their wiring closets with Layer 3 switches, he adds.

New features in Foundry's IronWare 7.2 firmware include 802.1ad link aggregation support for link redundancy. Also, 802.1w rapid spanning tree protocol is included for providing recovery from a network outage.

The features promised in IronView II should help Foundry's overall enterprise switch business, which has been slacking, analysts say.

According to Dell'Oro Group, Foundry's switch sales were down 8% in the third quarter of 2000, trailing far behind its enterprise competitors such as Nortel Networks, Extreme Networks and Cisco, whose sales increased 39%, 21% and 18%, respectively.

"The management application is killer for Foundry," says Joel Conover of Current Analysis. "In order for Foundry to make a new play in the enterprise market, this was something they needed to do."

IronView II should help Foundry play catch-up with competitors, such as Enterasys and Cisco, which have had their own network management software for some time, he says.

While IronView II addresses enterprise customers, Conover says the fault tolerance and fast spanning tree features in Foundry's new firmware are geared more toward metropolitan service providers.

"These are areas that might be attractive to service customers who are not typical Foundry service providers, such as metro-area providers," he says.

> ***"The management application is killer for Foundry. . . This was something they needed to do."***
>
> Joel Conover, analyst, Current Analysis

Foundry also announced a new MiniGBIC (Gigabit Interface Connector) module and management module — its first GBIC — for connecting its switches to a backbone via Gigabit Ethernet. The module allows for up to eight Gigabit Ethernet ports per slot. The management module is a switch processing blade that provides intelligence for Foundry switches and has an integrated eight-port MiniGBIC.

The MiniGBIC module and management module are available now and cost $8,500 and $12,500, respectively. Foundry IronView II will be available in March. Pricing was not available at press time. IronWare 7.2 is available for free to Foundry customers with support contracts.

Foundry Networks: www.foundrynet.com

Foundry's software forge

Foundry Networks this week will announce switch firmware and network management software. The combination will let users:

- Apply access control lists on Layer 2 switches to help direct access to net resources.
- Run reports on network performance and configuration.
- Auto-discover and inventory Foundry network equipment.

New IronWare 7.2 firmware is available for all Foundry switches, such as the BigIron XL.

Load-balancing, content mgmt. on tap from F5

BY APRIL JACOBS

Switch maker F5 Networks last week upgraded its Internet traffic, content and network management products that could give users better ways to speed and manage their e-commerce infrastructure.

The announcement includes upgrades to F5's load-balancing platform, 3-DNS Controller; its content management products, Edge-FX Cache and Global-Site Content Controller; and its network management software, See-IT. F5 offers two load balancers, Big-IP for LANs and 3-DNS for WANs.

F5 also announced plans to offer a software development kit, called iControl SDK, which integrates with its traffic-management products and could let users monitor hardware and software. To that end, F5 plans to partner with hardware and software application vendors such as Dell, EMC, Microsoft and Oracle. Using iControl with F5's Big-IP load balancer, an end user could balance Web traffic loads across Microsoft Application Center clusters and monitor and control performance using information that iControl gives them. F5's Big-IP load-balancing appliance typically sits in front of a Web server farm, distributing requests for content based on factors such as server availability and request type.

F5's plans to give users the ability to get to applications they are using gives it at least a temporary edge over competitors such as Cisco and Nortel Networks, according to Jupiter Communications analyst Peter Christy. Using iControl to automatically recognize network devices could save network managers the hassle of configuring those devices to work with load balancers.

Other features on F5's 3-DNS Controller, which also provides load balancing, include the ability to perform content peering and traffic redirection when content is being updated. The content-peering feature lets users direct traffic based on an end user's country of origin.

F5 has also enhanced its Edge-FX Cache, which sits in front of a Web-server farm, to work with its Global-Site Content Controller Management software so users can refresh content across their networks automatically. Cache devices such as Edge-FX, which store content, let users serve pages to surfers more quickly than Web servers, which have to construct content requests on the fly.

Enhancements to F5's See-IT network management software include the ability to let users gather data on their load balancers and caches. See-IT now gives network managers the ability to get performance reports for Big-IP load balancers that work in pairs or individually.

F5's 3-DNS Controller is available now and costs $34,990; Edge-FX Cache is also available now and costs $9,990. Global-Site is available now and costs $29,990, and See-It Network Manager is also available and costs from $9,990 to $49,990, depending on the configuration.

F5: www.f5.com

Volera,
continued from page 19

era are focused on streaming media, security and management of content. We would rather let third-party developers create other applications.

Presently, we have an [API] available that will let developers write to Volera's [caching] platform. For example, Edgix is developing an API that takes data from satellites and puts it into the cache. We are working with service providers to do applications, such as ad injection and ad stripping.

Will this API be proprietary, or will it work with caching equipment in general?

Although we are going to offer several interfaces, the API will be specific to Volera. If anybody delivers over the Internet Content Adaptation Protocol [ICAP], we will be able to support it since we support [that standard]. ICAP Version 1 is available now. We plan another API that allows third-party [companies] to develop on their own without assistance from our staff. That will be available later this year.

Wired Windows . Dave Kearns

WINDOWS XP MAY NOT BE WHAT YOU THOUGHT

Windows XP, the Windows eXPerience (I thought that was what the "blue screen" was) will be coming soon to a retailer near you.

Hopefully, though, it won't be coming to an office desktop near you. Or near any of your users, for that matter.

XP is, first and foremost, an entertainment experience — games, multimedia, TV, movies, music — it's a game machine, set-top box, DVD player and audio-combo rolled into one. Just the things you've been trying so hard to eliminate from your desktop machines (and who really wants to watch movies on a 15-inch screen in 256 "dazzling" colors?).

XP is about the "shared experience" of family computing. Lots of good new things for a multiuser machine — but how many of your users share their PC?

XP introduces yet another version of the Windows graphical user interface (GUI). If you've followed the recommended trend you've gone from DOS to Windows 3.X to NT 4 to Windows 2000 Professional — and changed the GUI each time! Just one more reason for the Macintosh-lovers to chuckle — Apple got the GUI right the first time.

Then there's the feature many are touting as the best new thing to come to the Windows desktop since the Help system — the ability to take control of another PC across the Internet in a sort of ad hoc, easy-to-setup, quick-and-dirty VPN system. Supposedly, this is so that you — the knowledgeable Windows user — can connect to your mom or dad's PC and fix whatever they've managed to screw up.

I understand the hackers and crackers threw parties when they heard about this feature. Of course, Microsoft assured us that it will be secure — just like Exchange, Internet Explorer, Active Basic, Windows Scripting and all those other technologies that seem to be compromised within a day of their release.

XP may be more robust and reliable than Windows 9X/ME — it is built on the NT/2000 kernel. But you aren't running 9X or ME on your business desktops, are you? Shame on you! To upgrade to XP, you'll need to invest in just as much hardware as to upgrade to Win 2000 Professional, so do the right thing and go for the business operating system. Don't be fooled when Microsoft announces the "business version" of XP — unless they remove all of the stuff I mentioned earlier, it doesn't belong on your desktops. Don't even think about it.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of The Week

If you need reasons to justify an upgrade to Windows 2000, and you didn't watch the Networked World on Feb. 9, you can browse to www.nwfusion.com (DocFinder: 3127) and watch a rebroadcast at your leisure.

"I opened a virus by accident."

Translation: I opened a virus like you told me not to.

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Net.Worker

Products, services and strategies for tying teleworkers to the enterprise

Briefs

The home network market is expected to balloon to $13 billion by 2005, according to a recent report from Aberdeen Group. As equipment grows more affordable, applications proliferate and large-scale service providers begin marketing new products and services, the number of networked homes will grow from 650,000 last year to 37 million by 2005, with much of the growth attributed to new homes built with structured wiring.

Symantec just released Version 10 of its PC Anywhere remote access software. Because opening remote connections can be risky, new security features such as mandatory password protection, an encryption wizard and new authentication types have been added, whether you use the software to troubleshoot teleworkers' remote systems or access files on the system at the home or office.

PC Anywhere Version 10 costs about $179 per seat.

Symantec: www.symantec.com

A recent study by the Interactive Products and Services Group reveals that 11% of American adults use a mobile phone or handheld PDA to access the Web (7% cell phone; 4% PDA). Wireless Web users tend to be affluent young males between the ages of 18 and 34, with household incomes in excess of $100,000. According to the study, 83% use Web devices for personal use, 49% for work and 30% for school.

A recent report from market research firm IDC predicts that DSL subscribers will outnumber their cable modem counterparts by 2003, reaching 66 million worldwide by 2004. Much of the growth is attributed to pent-up demand from work-at-home households.

Overworked? Hire a helping hand

BY TONI KISTNER

Jill Poole had a full plate. As the network administrator for Quality Publishing Services, a trade magazine company, Poole supported 50 workers in the Houston main office, a four-person remote office in Mount Airy, N.C., 10 full-time teleworkers, the circulation manager in Kansas City, Mo., and nine sales representatives who lived in their respective territories. And on top of that, many in the Houston office regularly teleworked one or two days a week.

Though Poole isn't the type to complain, she was clearly stretched too thin. Part of the blame fell to the company's liberal telework policy, which required Poole to spend a lot of time troubleshooting remote workers' system problems over the phone.

"Obviously, the more telecommuting we have, the more time-consuming that is for Jill," says company COO, Kelli Meyer. Moreover, the company's network was a mixed environment of PCs and Macs, and while Poole had been managing basic Mac support, it wasn't her specialty.

Meyer had to face facts, she needed someone to handle Mac support and special projects so Poole could concentrate on supporting PCs and remote staff. "But I didn't want to hire a second full-time IT person," she says.

Meyer did some digging and through word of mouth learned about All Bases Covered (ABC), a nationwide IT outsourced services company that's kept a low profile. ABC offers a slew of network services to workgroups of less than 100, whether they are small offices, branch offices or teleworkers. The 3-year-old company in Redwood City, Calif., launched with 40 employees and has since grown to 700, with 18 offices in major metropolitan areas.

"There are 7.5 million small businesses with 51 million computers — everyone is a potential customer," says Andrea Skov, vice president of marketing and business development. More realistically, ABC will take on any company within a 100-mile radius of its offices.

Under its All Care Covered plan, customers contract for a minimum number of hours of on-site support per month. Support is whatever customers need. For instance, ABC support consultants will provide regular equipment troubleshooting and maintenance, help select new products and services, tackle a database project and train employees on new applications.

Rates are reasonable, about $125 per hour, per technician, and the hours can be distributed in any way. For instance, if you contract for 10 hours per month, you can use up those hours in one week or spread them out along several visits. If in one month, you want the 10 hours to be spent on a specific project that requires two technicians,

See **ABC**, page 28

SLAs hard to get for teleworkers

Expect to pay at least $80 per month for DSL service guarantees.

BY MICHAEL MARTIN

When it first popped up on IT radar screens in the late 1990s, DSL was touted as the technology that would spur companies to launch telework programs and free smaller companies from ISDN and T-1 lines. But the hype hasn't lived up to the reality.

Customers are plagued by outages and shoddy service, making the need for service-level agreements (SLA) a critical part of the equation. While providers acknowledge the need for guarantees, they've been slow to deliver.

No major incumbent local exchange carriers (ILEC) or DSL wholesalers offer much in the way of SLAs. "We don't offer any guarantee of uninterrupted service," Verizon spokesperson Larry Plumb says. "There's a recognition of the need for SLAs, and we'll move there over time. But we don't have carrier-class equipment yet for DSL, and SLAs are driven in part by the equipment."

To its ISP resellers, DSL wholesaler Covad Communications provides SLAs covering uptime, latency and packet loss over its national ATM backbone, but not to customers of its symmetric DSL (SDSL) service. "SLAs would be hard for customers to monitor," Covad Vice President Avhi Ingle says. "If they're not happy with the service, we'll allow customers to cancel it, which is a simpler solution."

More encouraging, a handful of DSL providers — typically value-added resellers — have begun offering SLAs to business customers and high-end telecommuters as part of a larger corporate package. But guaranteed service packages cost about $100 or more per month, which adds up fast when you support high numbers of home-based workers.

Intermedia, of Tampa, Fla., offers SDSL service with SLAs to remote offices of large corporations and small to midsize businesses starting at $139 per month for a 128K bit/sec line. The guarantee includes 99.9% network availability, service restoration within four hours of an outage and a maximum network delay of 160 milliseconds. Notably, customers can

See **SLA**, page 28

Telework Beat . Toni Kistner

REMOTE MANAGER'S SECURITY CHEAT SHEET

Most teleworkers routinely troubleshoot their PCs; some even manage small-office networks. But when it comes to security, we're all in over our heads. Do you need a VPN? A firewall? Both? Why? Reading up only makes it worse. Encryption . . . authentication . . . IPSec . . . L2TP. . . Diffie-Hellman. . . Blowfish. . . . Everything's an algorithm. Great.

To find out what network managers and teleworkers need to know to buy smart, we asked Leslie Stern, senior product marketing manager with CheckPoint Software Technology, the enterprise market leader in integrated VPN appliances and software-based firewalls.

What's what. For starters, a remote access VPN secures the data in transit between your home office and the corporate network. A desktop firewall secures the PC from Internet attack. If you put a VPN client on a remote system that isn't protected by a firewall, the VPN session is vulnerable — the whole corporate network is vulnerable. In most cases, remote workers need both, Stern says.

One product or two. One big issue is whether you should use a separate VPN client and desktop firewall, typically from different vendors, or an integrated VPN and firewall. As the product manager of CheckPoint's VPN-1 Secure Client, Stern is a big fan of integration.

"It's not trivial to get a personal firewall and a VPN client to coexist. And even the most basic management functions, like adding and deleting users, has to be done twice," she says.

Also, integration allows the firewall and VPN to work in concert. Each time a user establishes a VPN connection, the machine and security policy will be checked to ensure there's nothing risky in the machine's configuration. If the machine is configured correctly, the user gets a VPN session. But if the user tries to uninstall the firewall or alter the security policy, he won't get a VPN session, she adds.

Easy management. You need to roll out firewalls to everyone, keep them up to date, specify a security policy central and ensure all your users are using the software appropriately. You want to specify the security policy and have it pushed out to all clients; you want as much automation as possible. You want centralized policy management you can update remotely. And think scalability: How will this product serve you in five years? Will it adapt to many new clients, small offices or the ability to connect to many larger nets?

Speed tweaks. Consider how performance is optimized, Stern says. "You want it to do selective encryption, to specify at the network gateway that only certain types of traffic need to be encrypted. You might not want to encrypt traffic going to public Web servers, like CNN.com. You want the ability to do 'split tunneling.' Some network managers want all remote VPN traffic to go through the corporate gateway, so they can see what people are doing. You want the choice, though."

Kistner is manager editor of the Net.Worker section. She can be reached at tkistner@nww.com.

ABC,
continued from page 27

you get them for five hours.

Of course, customers can always add more hours. But ABC doesn't require a signed contract to get service, and first-time emergency cases are welcome. The service is available at all times of the day and night. A client can call ABC at 3 a.m., and for about $190, it'll send someone out.

Beyond round-the-clock technical support, ABC offers data backup and provisioning services as well. If you get your DSL line through ABC, you'll benefit from the company's service-level agreement that it contracted with a wholesale provider partner. As part of the All Covered Care plan, ABC conducts a network assessment and determines a customer's PC utilization and security exposure, and makes suggestions for improvement.

But when it comes to security, Eric Hemmendinger, analyst with Aberdeen Group, is wary of trusting a soup-to-nuts services provider like ABC. "[Small to midsize businesses] want a security expert," he says.

But Skov says ABC may provide comparable, if not better, services than dedicated security companies.

"Unlike vendors whose underlying goal is to sell products, we're vendor agnostic," she says. "Depending on the customer's needs, we'll make several recommendations and let the customer choose. Because we're the people who install, monitor, maintain, repair and upgrade the equipment, we have to live with the technology decisions we make, same as the customer."

When pushed on partners, Skov admitted ABC has agreements with SonicWall and McAfee. "But if customers want a NetScreen firewall, we give it to them," she says.

Keep in mind that ABC focuses on small and midsize companies, and doesn't target telework programs per se. However, Skov says her company will support home workers as part of a larger corporate contract, though the pricing model favors an office environment with many desktops. A technician can service several desktops in an hour, so a home visit to check on one machine may be overkill. On the other hand, if you contract for two hours per month, per teleworker, arguably, you're getting your money's worth.

In the case of Poole, her company contracts 25 hours per month for an ABC technician to service the Mac systems and handle special projects.

This frees Poole to concentrate on her PC clients and remote workers, as well as the VPN, "which could be an angel or a devil on any given day," Meyer says.

SLA,
continued from page 27

monitor DSL performance on Intermedia's network through Web-based tools.

But Intermedia has no plans to extend SLAs to asymmetric DSL (ADSL) customers, leaving most teleworkers and casual remote workers out in the cold. "To do the monitoring and management necessary for an SLA is difficult," says Frank Pulaski, an Intermedia product manager. "It costs a lot of money and likely wouldn't be worth doing on an ADSL line."

DSL.net, a New Haven, Conn., DSL provider and ISP, also offers business-class SDSL services with SLAs, starting at around $145 per month. DSL.net proactively monitors its network, but doesn't provide user-monitoring tools like Intermedia's. "With our SLA, a customer would have to notice and notify us if there's anything wrong," says Ray Allieri, a DSL.net vice president.

The terms of DSL SLAs vary. DSL.net promises an average monthly round-trip delay of 80 milliseconds on its network. If that's not met, customers get a two-day service credit.

If DSL.net fails to meet the 80-millisecond average two months in a row, customers get a seven-day service credit. Other guarantees include 99.9% availability and a 15-minute mean time to respond to a problem. Service credits apply if these thresholds are not met.

Noting the importance of getting DSL SLAs to teleworkers, the U.S. government recently awarded a $300 million contract to 10 providers to connect government branch offices and remote workers via DSL — and the contract includes a basic SLA. Drawn up by the General Services Administration (GSA), the contract lets federal agencies turn to one of the 10 providers for DSL services.

Bill Horst, assistant regional administrator with the Boston region GSA, says the government knew getting SLAs for DSL would be a challenge. "But we wanted to ensure there was some sort of guarantee," he says.

"We didn't expect to get anything close to what a frame relay SLA currently offers. We wanted the vendors to know they would be held to the SLAs we'd written into the contract," he adds.

The government contract covers ADSL and SDSL installations. Some of the requirements include 24-7 help desk service; installation within 45 days of an order being placed; 24-hour repair; and a minimum speed of 128K bit/sec.

In addition, the contracted vendor is solely responsible for any problems with the DSL connections and is the government employee's single source of contact.

This is a key component because DSL installations typically involve up to three providers — an ILEC for the local loop, a wholesaler for the backbone network and an ISP for the implementation — making problem resolution frustrating as the various providers take turns passing the problem customer from one to the other, resolving nothing.

"They'll be the ones who bleed for us," Horst says.

Scoping out DSL SLAs

You won't find frame relay-like guarantees, but here's what you can expect for business-class symmetric DSL service:

Availability:	99.9%
Round-trip delay:	This will vary, but 80 to 160 milliseconds is reasonable.
Mean time to repair:	A good provider will offer 24-hour, or next business day, turnaround.
Help desk:	24-7
Cost:	$130 per month or more for a 128K bit/sec SDSL line.


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Carriers & ISPs

The Internet, Extranets, Interexchange and Local Carriers, Wireless, Regulatory Affairs

Briefs

CityNet Telecommunications has announced the expansion of its sewer-based, fiber-optic communications network in Indianapolis. The Silver Spring, Md., company is building a fiber-optic network through municipal sewer pipes using specialized robots called Sewer Access Modules. Cameras on the robots allow installation of stainless steel alloy rings to support fiber-optic cable inside the pipes. The conduit that encases the fiber is made of the same stainless steel alloy that protects the fiber from damage. The Indianapolis network project will begin in April. CityNet has networks in Albuquerque, N.M., and Omaha, Neb. CityNet has 12 agreements with municipalities in the U.S. and Europe.

CityNet: www.citynettelecom.com

Verizon Wireless last week completed the initial $170 million stage of a $320 million network expansion in Florida. The expansion broadens the geographic reach and capacity of Verizon Wireless' digital Code Division Multiple Access network. The additional capacity will let Verizon Wireless offer new services, such as wireless data applications. Verizon says it can now offer services to 13 million of Florida's 15.9 million residents.

Verizon Wireless: www.verizonwireless.com

Savvis Communications is getting an influx of cash from private equity group **Welsh, Carson, Anderson & Stowe.** The group, which already owns 16% of Savvis, is investing $20 million in the service provider in exchange for stock. Savvis expects to get funding from additional sources throughout the year to bankroll the company's growth plans for this year.

Savvis: www.savvis.com

GiantLoop boss talks about big picture

NetworkWorld Q3A

GiantLoop Network opened for business late last year with a focus on building and managing private fiber-optic networks for large customers. Network World contributor Michael Martin recently sat down with the company's newly appointed CEO, Mark Ward, to discuss GiantLoop's direction.

PATRICK O'CONNOR

What sets GiantLoop apart from other network providers?

What we've learned from our experience in the IT industry is that there's a strong convergence taking place between data center requirements and optical networking. From my position at EMC, I saw the largest consumers seeing a lot of pain between their data storage protocol support requirements and emerging optical networking technology, specifically [dense wave division multiplexing (DWDM)]. We have yet to see another vendor do the customer-care packaging, the technology infrastructure and implementation around the convergence we have.

Are you using a pure storage pitch then, or going after all of a company's network business?

What we offer is what we call multiservices protocol support. We pick up Gigabit Ethernet, OC-3 through OC-48 in the metro and [Fibre Connection (FICON)], [Enterprise Systems Connection (ESCON)], Fibre Channel — all the storage protocols. We're aggregating three decision points down to one. So when you choose a GiantLoop platform, you're solving three problems at once. You're solving your storage networking issues, you're solving your SONET, ATM issues, and you're providing a footprint for the explosion in Ethernet and IP traffic that will be services over Gigabit Ethernet.

So you're going after all the metropolitan-area business then?

Yes. I use the 80/20 rule. Eighty percent of the IT consumption is done by

See **GiantLoop**, page 32

C&W turns to ART to speed wireless provisioning

Company claims time to provide service will drop from months to days.

BY DENISE PAPPALARDO

VIENNA, VA. — Cable & Wireless is teaming with Advanced Radio Telecom in an attempt to offer speedier service delivery by taking incumbent local exchange carriers out of the equation.

The ISP and ART have inked a 10-year deal worth $11 million. Cable & Wireless will use ART's fixed wireless network to provision its IP services to large business users in markets around the U.S.

"The benefit is in the last mile," says Todd Haven, vice president of commercial development at Cable & Wireless. Data service providers are pushing capacity limits on local exchange carrier networks, which result in provisioning delays, he says.

Cable & Wireless expects it will be able to provision OC-3 (155M bit/sec) customers to its IP network in a handful of days instead of one to three months.

"Service providers have to take a look at a broad range of access technologies if they're serious about serving customers," says Lisa Pierce, telecommunications director at consulting firm Giga Information Group. "Cable & Wireless has committed to doing more than just a trial here."

Pierce notes that fixed wireless can't totally bypass all local wireline infrastructure, but is an alternative. When time to market is a critical factor, fixed wireless is faster than dealing with LECs and could cost less, she says, although providers aren't eliminating a truck roll. Receivers still have to be installed.

Cable & Wireless will use ART's 38-GHz wireless network to support dedicated Internet access and managed VPN service customers that need fast access. Initially, Cable & Wireless will use the fixed wireless option for customers that need connectivity at 155M bit/sec. But the ISP expects to offer lower and higher speed options, Haven says.

"We've agreed to roll out the service in a few cities right now," Haven says. The ISP needs to make sure the network can support its existing service-level agreements.

This is not an exclusive deal with ART, which lets Cable & Wireless team with other providers for greater coverage. But it's not surprising that the ISP is teaming ART as its first fixed wireless partner. Former Cable & Wireless CEO Wharton Rivers is CEO of ART. ◪

GiantLoop,
continued from page 31

20% of the users in the marketplace. So rather than focus on the small to medium enterprise or dot-com, our target audience is Fleet, Goldman Sachs, GE, Bank of America, Schwab — folks like that. Those are the companies with multiple protocols in their metros, and they're looking to go to one enterprise-focused company to get it all. Another Achilles' heel that the market has presented us with is that customer service by the [incumbent local exchange carriers] has been very poor. Our ability to deliver customer care is being received very highly by the Fidelities and Fleets of the world.

PATRICK O'CONNOR

You solve three problems at once when choosing a GiantLoop platform, says company CEO Mark Ward.

When you go to connect an enterprise, do you connect the branch offices as well?

We have a partnership with 360 networks, so we can deliver data to GiantLoop [points of presence] in the metro areas and take that information out of, say New York City, to San Francisco. So we have an intercity product offering.

Would you do the smaller branch offices?

We're really focused on the largest bandwidth consumers, so we're focused on high-density data creation points. We're not going to bastardize our offering to go into the low-end satellite offices, but we will focus on the major metro areas worldwide.

How have these large companies handled the services that you're proposing to take over?

From a data side of the house, they've been relying on the AT&Ts, WorldComs and Verizons of the world to deliver the largest copper pipes available to them in the metros. The issue with that is their time to buildout has been horrendous.

To get an additional T-3 between two sites in the Manhattan/New Jersey area, you could wait upwards of 200 working days. Optical and DWDM over the fiber really changes the way they can look at business and turning up additional services. Once we install our metro network, they can procure and add bandwidth in a short period of time. It could be anywhere from 30 days to an hour, depending on what they sign up for.

On the IP side of the house, less than 10% of today's traffic is IP-centric when you look at the metro area. Over 50% of it is being generated by these data center protocols such as Fibre Channel, ESCON and FICON.

In how many metropolitan areas are you running?

We're not a [competitive local exchange carrier]. We don't prebuild a metro area. This is an important differentiator from some other folks. We go to the largest consumers and get a contract to build a private network for them. At that point, we procure dark fiber and all the equipment. We layer our software management architecture and deployment services on top of that. We are doing that actively in New York City, Boston, Chicago, San Francisco, Dallas and London right now.

How long does it take you to get a customer up and running?

Customers that are on net — those on existing fiber rings — we can get in 60 to 90 days. Those that require a lateral fiber buildout can be up in anywhere from 90 to 120 days from order.

How many customers do you have?

About 17, procuring either our professional services or managed services.

What was the reason behind the management changes seen at GiantLoop recently?

We're bringing on new skill sets to go after new business aggressively. I used to run the Global Marketing and Services business at EMC. One of the people I worked closely with, Jim Sullivan, ran a great portion of our Western regional sales and most recently built out the entire Asia-Pacific sales organization.

Jim left EMC about five months ago, and we were able to convince him to come on board and be COO. Harry Dixon [co-founder and former CEO] is still involved in the company. Harry in assuming the chairman-only role is focused on being able to raise cash in the capital markets. ◪

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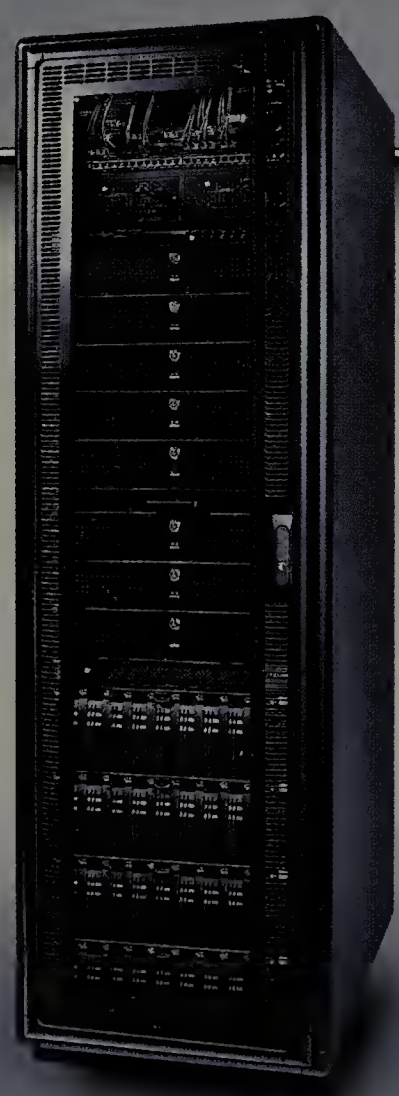

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Eye on the carriers . David Rohde

Ask your in-building carrier for proof

Sooner or later your company will find itself with a branch office in a multitenant building "prewired" for broadband service.

There are at least three types of building-centric broadband carriers. One is the established shared-tenant providers, led by Intermedia's Advanced Building Networks. Another is the fixed-wireless local loop carriers, such as Winstar, Teligent and XO. There are the new building local exchange carriers established by commercial real estate firms. A common theme among them is they are "aggressively" moving to wire buildings.

Here's a tip: Consider visiting each building where these carriers have contracts and poke around to see how aggressive they really are.

Stories are rampant about tenants finding themselves in these supposedly charmed office buildings and then waiting ... and waiting ... for the in-building carrier to provide serviee.

Recently we've had a parade of vendors to this market come through our office. They say their carrier customers maintain detailed spreadsheets to decide which buildings they will serve, no matter what announcements they've made with real estate developers.

Generally these carriers will not invest the capital unless they know they can sign up at least 20% of the tenants in a building. Because many office buildings contain branch offices of national corporations with large-carrier, multisite term contracts, there tends to be a cap on the penetration these carriers think they can achieve.

For example, look at fixed-wireless provider Teligent. As of its November report to the Securities and Exchange Commission, Teligent had installed 433,997 lines to serve 34,189 customers in 4,412 buildings. But Teligent also reported it had secured access rights to an additional 7,483 buildings to which it had yet to begin providing service.

The grinding pace of wiring buildings has led to bitter accusations. Fixed-wireless carriers and other competitive local exchange carriers (CLEC) blame recalcitrant landlords and Bell-company delaying tactics. When talking with the Virginia public relations firm for a national trade group and a Chicago market research firm specializing in CLECs, I found both firms are in buildings where in-building CLEC service was promised months ago and never delivered.

The Building Owners and Managers Association commissioned a study of this situation, and sent these key findings last month to the Federal Communications Commission: "CLECs prefer buildings of at least 150,000 square feet and having 10 or more tenants. That means that published CLEC building penetration rates based on the total number of office buildings in all markets are misleading and irrelevant. ... The CLEC business model is to build a mature network in a few markets, connect large customers to demonstrate rapid profitability, and then expand in two directions: connecting smaller buildings within the mature-network markets, and repeat the cycle in new markets."

Bottom line is you better ask to see those carrier spreadsheets before counting on rapid installation.

Rohde is managing editor of The Edge section of Network World. *He can be reached at drohde@nww.com.*

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B201

1. What is the principal business activity at your location? (check ONE only)

01. ☐ Manufacturing (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities/Process Industries/Mining, Construction, Petroleum, Refining, Agriculture, Forestry
10. ☐ Education
11. ☐ Government/Military
12. ☐ Consulting (Independent) *
13. ☐ Communications Carriers
14. ☐ ISP
15. ☐ ASP
16. ☐ Manufacturing (Computer/ Communications/OEM)
17. ☐ Resellers/VARs/VADs/Integrators/ Distributors* (Computers/Communications)*
18. ☐ Other (please specify) _____

*Attn Consultants, Integrators, Distributors, Resellers: Please complete form based on ALL clients and your own business needs

2. P: What is your primary job function? (check ONE only) S: What is your secondary job function? (check ALL that apply)

P	S		P	S		P	S	
☐	☐	1. Network Management	☐	☐	5. Internet/Intranet/ E-Commerce Management	☐	☐	8. Consultant (Independent)
☐	☐	2. LAN Management	☐	☐	6. Engineering Management	☐	☐	9. Other (please specify) _____
☐	☐	3. Datacom/Telecom Management	☐	☐	7. Corporate Management (CEO, COO, CFO, Pres., VP, Dir., Mgr.)			
☐	☐	4. CIO/CTO/IS/IT/MIS/ Systems Management						

3. What is the estimated value of Network equipment and services that you specify, recommend, or approve the purchase of?

(Please print the appropriate number code on the line next to each product category. Please complete ALL categories A–O.)

1. $100 Million or more
2. $50 Million to $99.9 Million
3. $25 Million to $49.9 Million
4. $10 Million to $24.9 Million
5. $1 Million to $9.9 Million
6. $100,000 to $999,999
7. $50,000 to $99,999
8. Under $50,000
9. None of the above

A ____ Large Systems *(Mainframes/Minis)*
B ____ Desktops *(Micros/Laptops/Workstations)*
C ____ Mobile *(including PDAs, Wireless)*
D ____ Servers
E ____ LANs
F ____ WAN Equipment
G ____ Carrier Services
H ____ Internetworking *(including Routers, Switches)*
I ____ Internet/Web/E-commerce
J ____ Intranet/Extranet
K ____ Remote Access
L ____ Peripherals
M ____ Software
N ____ Service/Support Services
O ____ Storage

4. What is the total number of sites for which you have purchase influence? (check ONE only)

1. ☐ 100+ 2. ☐ 50 to 99 3. ☐ 20 to 49 4. ☐ 10 to 19 5. ☐ 2 to 9 6. ☐ 1 7. ☐ None

5. What is the total number of Servers/Clients/LANs installed/planned at your location/ in your entire organization? (check ONE box in each column)

SERVERS			CLIENTS			LANs		
At Location		Entire Org.	At Location		Entire Org.	At Location		Entire Org.
A		B	C		D	E		F
☐	1. 50,000+	☐	☐	1. 50,000+	☐	☐	1. 50,000+	☐
☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐
☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐
☐	4. 100 to 999	☐	☐	4. 100 to 999	☐	☐	4. 100 to 999	☐
☐	5. 50 to 99	☐	☐	5. 50 to 99	☐	☐	5. 50 to 99	☐
☐	6. 10 to 49	☐	☐	6. 10 to 49	☐	☐	6. 10 to 49	☐
☐	7. 1 to 9	☐	☐	7. 1 to 9	☐	☐	7. 1 to 9	☐
☐	8. none	☐	☐	8. none	☐	☐	8. none	☐

6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check ONE only)

CORPORATE:
1. ☐ Entire Enterprise/Multiple Enterprises
2. ☐ Division/Multiple Divisions
3. ☐ Department
4. ☐ None

B. Involvement (check ALL that apply)
1. ☐ Create Network/IT Strategy
2. ☐ Recommend/Specify Brand
3. ☐ Approve Purchase
4. ☐ Evaluate Products/Services
5. ☐ Determine the Need
6. ☐ None

7. What is the estimated number of employees at your location/in entire organization? (check ONE in each section)

A. At your location:
1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 250 – 499
8. ☐ 100 – 249
9. ☐ 99 or less

B. Entire organization:
1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 499 or less

8. Please indicate the Internet/Intranet/WAN/LAN/Remote products/services that you are currently involved in purchasing or plan to purchase (check ALL that apply)

A. Currently involved in purchasing B. Plan to purchase

INTERNET/INTRANET

A	B		A	B		A	B	
☐	☐	01. VPN Equipment	☐	☐	07. Web Hosting	☐	☐	13. Web Based Collaboration/ Groupware
☐	☐	02. VPN Services	☐	☐	08. Content Hosting	☐	☐	14. Web Acceleration/Caching/ Load Balancing Products
☐	☐	03. Firewalls/Security/Encryption	☐	☐	09. Traffic Management			
☐	☐	04. Electronic Commerce Tools	☐	☐	10. Web Development Tools			
☐	☐	05. Web Servers/Software	☐	☐	11. Management/Monitoring Software	☐	☐	15. Other Internet/Intranet
☐	☐	06. Internet Services	☐	☐	12. Web Based Management Tools			

LANs/INTERNETWORKING

A	B		A	B		A	B	
☐	☐	16. Local-Area Networks	☐	☐	26. Layer 4-7 Switches	☐	☐	34. Hubs/Intelligent Hubs/ Stackable Hubs
☐	☐	17. Network Operating System Software (NOS)	☐	☐	27. ATM Switches	☐	☐	3S. Cables,Connectors, Baluns
☐	☐	18. Intel Based Servers	☐	☐	28. Token-Ring Switches	☐	☐	36. Management Frameworks
☐	☐	19. Intel Based Multiprocessor Servers	☐	☐	29. Network Storage (NAS, SANs)	☐	☐	37. Call Center Tools
☐	☐	20. RISC Based Servers	☐	☐	30. Storage/Backup (Optical, Disk, Tape, RAID)	☐	☐	38. Voice over LAN
☐	☐	21. Clustered Servers	☐	☐	31. Network Test/Diagnostic Tools	☐	☐	39. Other Local-Area Network/ Internetworking
☐	☐	22. Print Servers	☐	☐	32. UPS			
☐	☐	23. Routers	☐	☐	33. Network Interface Cards (NICs, PCMCIA)			
☐	☐	24. Layer 2 Switches						
☐	☐	25. Layer 3 Switches						

REMOTE/WIRELESS

A	B		A	B		A	B	
☐	☐	40. PDAs	☐	☐	42. Remote Access Services	☐	☐	44. Other Remote/Wireless
☐	☐	41. Remote Access Products	☐	☐	43. Wireless Data Equipment/Services			

WAN EQUIPMENT & SERVICES

A	B		A	B		A	B	
☐	☐	4S. Modems	☐	☐	S1. FT-1/T-1/T-3 Services	☐	☐	58. Managed LAN/Router Services
☐	☐	46. Cable Modems	☐	☐	52. xDSL Services/Products	☐	☐	S9. Fax Servers/Services
☐	☐	47. Asynchronous Transfer Mode (ATM)	☐	☐	S3. Diagnostic/Test Equipment	☐	☐	60. Other WAN Equipment/Services
☐	☐	48. Frame Relay Equipment including FRADS	☐	☐	S4. DSU/CSU			A B
			☐	☐	S5. PBXs			None of the above (1 – 60) ☐ ☐ 61.
☐	☐	49. Frame Relay Services	☐	☐	S6. Voice/Video over IP Gateways			
☐	☐	S0. ISDN Equipment/Services	☐	☐	S7. Videoconferencing			

9. Please indicate the Network hardware/software/services that you are currently involved in purchasing or plan to purchase: (check ALL that apply)

A. Currently involved in purchasing B. Plan to purchase

SYSTEMS/PERIPHERALS

A	B		A	B		A	B	
☐	☐	01. Laptops/Notebooks	☐	☐	05. Storage/Backup (Optical,Disk,Tape,RAID)	☐	☐	08. Minis
☐	☐	02. PCs				☐	☐	09. Mainframes
☐	☐	03. Windows Terminals/Thin Clients	☐	☐	06. Printers	☐	☐	10. Fax/Modem Boards
☐	☐	04. Workstations	☐	☐	07. Printer/Fax/Copier Hybrids (Multifunction Printers)	☐	☐	11. Memory/Chips/Boards/Cards
						☐	☐	12. Other Computers/Peripherals

SOFTWARE/APPLICATIONS

A	B		A	B		A	B	
☐	☐	13. Network Management (incl. SNMP)	☐	☐	20. Groupware	☐	☐	27. Document Management
☐	☐	14. Systems Management	☐	☐	21. E-Mail	☐	☐	28. Site Metering Tools
☐	☐	1S. Security	☐	☐	22. Enterprise Resource Planning (ERP)	☐	☐	29. Data Warehousing
☐	☐	16. Directory Services	☐	☐	23. EDI	☐	☐	30. Anti Virus Software
☐	☐	17. Operating Systems	☐	☐	24. Desktop Videoconferencing	☐	☐	31. Multimedia
☐	☐	18. Applications Development Tools	☐	☐	25. Imaging	☐	☐	32. Helpdesk
☐	☐	19. Database Management/RDBMS	☐	☐	26. Middleware/Serverware	☐	☐	33. Other Software/Applications

SERVICES

A	B		A	B		A	B	
☐	☐	34. BPO (Business Process Outsourcing incl. Financial Services, HR, Logistics, etc.)	☐	☐	35. ASP Services	☐	☐	38. Education/Training Services
			☐	☐	36. Call Center Outsourcing	☐	☐	39. Other Services
			☐	☐	37. Systems Integration/Consulting			A B
								None of the above (1 – 39) ☐ ☐ 40.

10. Please indicate the platforms that are currently installed/planned: (check ALL that apply)

A. Currently installed B. Planned for purchase

NETWORK PROTOCOLS

A	B		A	B		A	B	
☐	☐	01. TCP/IP	☐	☐	05. APPC/APPN/LU 6.2	☐	☐	09. HTTP
☐	☐	02. IPV6	☐	☐	06. NETBIOS/NETBUEI	☐	☐	10. Other Network Protocols
☐	☐	03. SNA	☐	☐	07. NFS			
☐	☐	04. Novell IPX/SPX	☐	☐	08. SNMP			

LAN/WAN ENVIRONMENT

A	B		A	B		A	B	
☐	☐	11. Gigabit Ethernet	☐	☐	17. Layer 3,4 Switching	☐	☐	23. DSL
☐	☐	12. Switched Ethernet	☐	☐	18. FDDI	☐	☐	24. ISDN
☐	☐	13. Fast Ethernet	☐	☐	19. 100Base-T	☐	☐	25. Frame Relay
☐	☐	14. Ethernet	☐	☐	20. 10Base-T	☐	☐	26. Private Line T1, T3, FT-1, SONET
☐	☐	15. ATM	☐	☐	21. Fibre Channel	☐	☐	27. Other LAN/WAN Environment
☐	☐	16. Token Ring/Token Ring Switching	☐	☐	22. Wireless LANs			

NETWORK OPERATING SYSTEM

A	B		A	B		A	B	
☐	☐	28. Windows NT/Windows 2000	☐	☐	31. Novell (NetWare 2.X,3.X)	☐	☐	34. Banyan (Vines)
☐	☐	29. Novell (NetWare 5.X)	☐	☐	32. LINUX	☐	☐	35. IBM (LAN Server)
☐	☐	30. Novell (NetWare 4.X)	☐	☐	33. Microsoft (LAN Manager)	☐	☐	36. Other Network Operating System

COMPUTER OPERATING SYSTEM

A	B		A	B		A	B	
☐	☐	37. NT Workstation	☐	☐	42. LINUX	☐	☐	47. Digital VMS
☐	☐	38. Windows 2000	☐	☐	43. DOS	☐	☐	48. Macintosh
☐	☐	39. Windows 98/95/3.1	☐	☐	44. OS/2,OS/2 WARP	☐	☐	49. Other Computer Operating System
☐	☐	40. Intel based UNIX	☐	☐	4S. OS/400			A B
☐	☐	41. RISC based UNIX (incl. SOLARIS)	☐	☐	46. IBM MVS/VM/VSE/ESA			None of the above (1– 49) ☐ ☐ 50.

11. Which of the following hardware platforms are installed/planned in your company?

(check ALL that apply)

A - Mainframes (Large Scale)
1. ☐ IBM
2. ☐ Other

B - Minis (Midrange)
1. ☐ IBM RS/6000
2. ☐ IBM AS/400
3. ☐ Digital/Tandem/Compaq
4. ☐ Unisys
5. ☐ H-P
6. ☐ Other

C - Workstations
1. ☐ Sun Microsystems
2. ☐ H-P
3. ☐ Digital/Compaq
4. ☐ IBM
5. ☐ Silicon Graphics
6. ☐ Other

12. What is the estimated gross revenue of your entire company/institution?

(check ONE only)

1. ☐ $20 Billion or More
2. ☐ $10 Billion to $19.9 Billion
3. ☐ $1 Billion to $9.9 Billion
4. ☐ $500 Million to $999.9 Million
5. ☐ $100 Million to $499.9 Million
6. ☐ $50 Million to $99.9 Million
7. ☐ $10 Million to $49.9 Million
8. ☐ $5 Million to $9.9 Million
9. ☐ $4.9 Million or Less
10. ☐ None of the above

13. For which areas outside of the U.S.A. do you have purchase influence?

(check ALL that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ Africa
7. ☐ Canada
8. ☐ None

FORM: 0001

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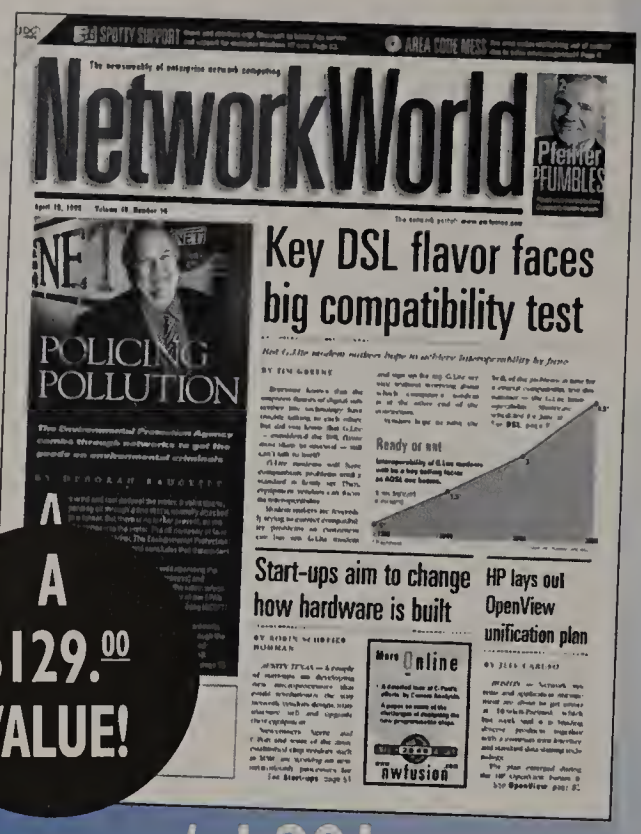

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The Edge

Service provider developments at the juncture between the enterprise and the new public network

Briefs

Broadband provisioning software vendor **Emperative** has released a new automated installation package called Cable Modem Express. The package adds several elements to Emperative's existing ProvEn provisioning engine for cable operators.

It includes an integrated Dynamic Host Control Protocol/Trivial FTP server for IP address management, plus XML interfaces for enabling end user self-provisioning through carrier back-office and customer-care applications.

Emperative: www.emperative.com

Wholesale local fiber provider **Metromedia Fiber Network (MFN)** has gone long-distance. MFN announced it has lit the first 10,000 route miles of its planned 18,000-route-mile domestic long-haul backbone, reversing the long-distance-to-local progression of other wholesalers such as **Level 3 Communications** and **Williams Communications.**

MFN intends to offer building-to-building service for carriers and large companies seeking to connect specific sites in major cities.

MFN: www.mmfn.com

Attention all vendors offering trade credit to service providers: Telecommunications led all industries in bond defaults in 2000, according to Moody's Investors Service.

Carriers defaulted on $6.48 billion worth of corporate bonds last year, about 13.3% of the total across the economy.

Leading the way was competitive local exchange carrier ICG Communications, now in bankruptcy, with $2.2 billion of bond defaults.

CoSine moves to make IP VPNs easier

Company targets scalable platform at carriers selling IP VPNs to multinationals, other companies.

BY DAVID ROHDE

An independent maker of IP service delivery switches has added Multi-protocol Label Switching capability to its flagship platform.

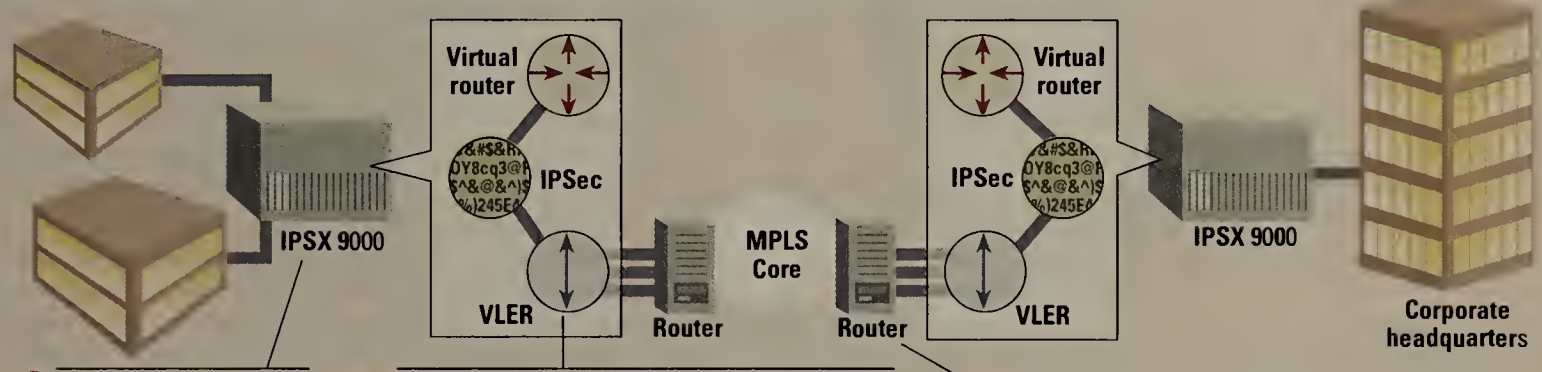
The move by CoSine Communications, announced last week, is designed to make its IPSX 9000 switch for service providers capable of delivering enterprise-grade IP VPNs with little or no requirement for new customer premises gear.

Together with the IPSX 9000's existing IP Security (IPSec), network-based firewall and virtual routing capabilities,

See **CoSine**, page 36

MPLS and IPSec together

CoSine's IP service switch, the IPSX 9000, now acts as a Virtual Label Edge Router to forward packets based on Multi-protocol Label Switching, while still supporting network-based IP Security for remote-access security.



1. Pre-existing virtual routing capability in the CoSine switch supports IP VPNs.
2. Also within the switch, a Virtual Label Edge Router (VLER) establishes a label-switched path matching a particular VPN defined by user group or application.
3. A Cisco or Juniper router supporting MPLS is used in the carrier backbone.

WestWave to add brains to carrier access gear

Start-up's concentration devices to gain signaling and control capabilities.

BY TIM GREENE

SANTA ROSA, CALIF. — WestWave, a start-up that has kept quiet until now, later this year will introduce an access switch it says will make deployment of voice over DSL and other emerging services less expensive and more efficient.

The company will sell a software-based access switch, as yet unnamed, that brings signaling and control capabilities to relatively dumb access concentration devices in carrier networks that directly link to customer lines.

Traditionally, signaling and control are incorporated in expensive switches that sit in service provider switching offices. Combining the switching capabilities of the access concentrators with the signaling and control from WestWave's access switch results in an edge device that can sort traffic, prioritize it and set up switched virtual circuits to carry it to the appropriate backbone network.

In the case of voice over DSL, the access device, called a DSL access multiplexer (DSLAM), would sort packet voice coming from customers from data coming from customers and could trunk the traffic directly to voice or data networks. That would eliminate the need for separate gateway hardware to sort and switch the traffic after it is aggregated by the DSLAM, says David Ehreth, president and CEO of WestWave.

The company will also make a hardware blade that fits in newer versions of traditional voice access gear in carrier networks called digital loop carriers (DLCs). The new DLCs will feature DSL termination blades as well. The WestWave blade will convert incoming packet voice to traditional phone traffic and trunk it to the carrier's voice switches.

The WestWave switch could similarly sort calls bound for ISPs. Carrier access

See **WestWave**, page 36

Compaq debuts new servers aimed at telcos

Servers feature more memory, processor power than previous central office products.

BY APRIL JACOBS

HOUSTON — Compaq last week launched two AlphaServer systems aimed at telephone company central offices that feature more memory and processing power than previous models.

The company's AlphaServer TS40 and AlphaServer TS20 are NEBS 3-certified servers and support signal processing software, including Compaq's IN7, as well as voice processing software like Dialogic's DM3. For carriers and service providers, the servers have features designed to be able to handle applications such as intelligent call routing, network-based call centers, call accounting, caller ID, Internet access and multimedia messaging.

Compaq says the servers can come preconfigured with software and an operating system to reduce installation time. Compaq will also offer service and integration for the servers, including engineering to help meet central office needs.

Compaq's new Central Office servers

The AlphaServer TS20/TS40 systems feature:

- One to four 833-MHz Alpha 21264A processors.
- Up to 32G bytes of memory.
- Support for OpenVMS, Tru64 Unix and Linux.
- Support for standard and Fast Ethernet, as well as Gigabit Ethernet.
- Hot-swappable redundant power and cooling, and autoreboot.
- Thermal management software, remote system management and RAID support.

The TS20/TS40 are part of Compaq's Central Office server family, which already includes the 4100CO and DS10CO. The TS20/TS40 provide more memory and processing power than the DS10CO, which was announced at the end of November.

The DS10 features the Alpha processor module with a 21264 processor sporting a 466-MHz CPU, or a 600-MHz CPU with ECC cache and up to 2G bytes of ECC 100-MHz memory. The server supports Compaq's Tru64 Unix. IDC estimates show that in 1999, worldwide server revenue was $61.4 billion, with $28 billion in Unix sales.

Both servers are available immediately and come with a standard three-year warranty. Pricing was not available.

Compaq: www3.compaq.com/telecom/solutions/SolutionDetails.asp?Category=10&Solution=213

CoSine,
continued from page 35

CoSine executives hope the MPLS support convinces carriers to use the switch as the basis for enterprise IP VPNs serving corporate and off-net sites.

MPLS is an increasingly popular traffic-engineering technique that uses discrete labels for distinct user and application groups to separate forwarding information from IP headers. The idea is to create multiple VPNs without requiring switching and routing gear to dive deep into headers to divine quality-of-service characteristics all the way through the network.

But unlike many existing MPLS-based services from large carriers, in CoSine's implementation MPLS is tightly coupled with IPSec for a full range of end-user access options.

As called for under the IETF's MPLS specifications, the IPSX 9000 acts as a Label Edge Router to create a label-switched path through the carrier network between any two corporate sites. But the switch also adds firewall and IPSec encryption application services for public Internet communications outside the MPLS VPN — all to give organizations fully secured extranets for extended numbers of authorized end users.

CoSine, a 1998 start-up that went public last year, largely competes with IP service switch vendors that have been snapped up by large manufacturers, such as Lucent's Spring Tide acquisition and the market-leading Nortel Networks' Shasta family of products. But the MPLS capability also brings the IPSX 9000 into the orbit of competition with carrier gear providing frame relay and ATM services, as well as customer premises gear supplied under carrier-managed IP VPNs.

Betting on all-in-one

CoSine officials are betting that service providers will spring for a network-edge platform that provides label switching and IPSec encryption all in one at the carrier site — while eliminating the need for outfitting customer premises with their own security. "For a carrier, the notion of supporting a multinational corporation with [customer premises equipment (CPE)] is kind of scary," says David Messina, CoSine's director of product marketing.

The IPSX 9000 is a 26-slot, 19-rack-unit chassis supporting different combinations of access, trunk and processor blades. It supports up to 1,400 T-1s per switch, with OC-3c, T-3 and Fast Ethernet interface options. But it also has built-in frame relay support, announced last fall, to support user sites with frame relay interfaces in transition to pure IP VPNs — up to 200,000 frame relay permanent virtual circuits per switch.

The IPSX 9000 is designed for carrier points of presence at the network edge, which would typically hand off MPLS-based traffic to Cisco or Juniper routers in the core (see graphic, page 35).

The switch comes with CoSine's InVision Service Management System, which centrally manages up to tens of thousands of discrete subscriber networks. Because CoSine is gunning for carriers serving sizable companies, the vendor also provides a browser-based customer network management system called InGage that lets corporate network administrators view and configure packet filter, Network Address Translation, firewall and bandwidth policies. InGage also provides usage accounting and multiple levels of user authorization and access control.

Messina quotes a sample configuration supporting 56 T-1 connections with virtual routing, MPLS VPN and IPSec firewall capability for $125,000. More fully loaded configurations would cost the service provider considerably more, although without the expense of managing CPE at hundreds or thousands of sites, he says.

Current CoSine customers, including a mix of carriers such as Covad Communications and Sweden's incumbent Telia, can get MPLS functionality as a no-cost upgrade to the IPSX 9000's IP Network Operating System software.

CoSine: www.cosinecom.com

WestWave,
continued from page 35

concentration devices would be able to identify phone calls headed for ISPs before they reach the local phone switches and trunk them directly to the appropriate ISP, relieving congestion that Internet calls can create.

"This is very pragmatic. It takes into account the real local loop where there is a DLC between the end user and the [switching office]," says Hilary Mine, an analyst with Probe Research.

Using WestWave gear, service providers can set up services such as packet voice over DSL links for 50% to 70% less than they would spend if they used a more centralized network architecture, WestWave claims.

The company needs to develop software interfaces between its switch and carrier access devices to add control and signaling capabilities. WestWave has an exclusive agreement with Alcatel to develop such an interface with Alcatel's Litespan digital loop carrier access device. Alcatel owns 34% of the market for such devices, according to Hilary Mine, an analyst with Probe Research.

WestWave CEO Ehreth formerly helped develop Litespan, and Alcatel is an investor in WestWave.

The WestWave access switch goes into customer trials this spring. Pricing has not been set.

WestWave: www.westwave.com

PROFILE: WESTWAVE

Location:	Santa Rosa, Calif., and Richardson, Texas
Founded:	May 1998 by David Ehreth
Product:	Public network access switch
Financing:	$51 million from Berkeley International, Goldman Sachs, Mont Reuil, Morgentheler and Sevin Rosen.
Competitors:	Lucent, Nortel, Telesis, Tacqua

Enterprise Applications

Intranets, Messaging/Groupware, E-commerce, Security, VPNs, Network Management, Directories

Briefs

Symantec last week released the latest version of its pcAnywhere remote access software, a product designed to help net professionals manage users' PCs across a network.

Version 10 of pcAnywhere aims to build on the company's past efforts to give administrators access to servers and PCs across a corporate network or the Internet. The software allows an administrator to log on to a computer remotely, identify certain types of problems and fix them. The software includes security features and tools for speeding data transfer. The new software adds functions for mandatory password protection, an encryption wizard and eight new authentication types.

Symantec added a Remote Access Perimeter Scanner for surveying corporate networks to make sure remote hosts have properly configured security protocols. PcAnywhere Version 10 is available for $179.

Symantec: www.symantec.com

IBM Global Services recently struck a deal with Tacit Knowledge Systems, a Palo Alto automation software provider, to develop knowledge management services.

The service, called Enterprise Knowledge Gap, lets customers identify areas of information that are critical to their businesses and find gaps in how the information is shared and applied across their businesses.

The service uses Tacit's automation software to analyze a business' electronic content for specific areas of expertise and common practices and experiences.

Global Services: www.ibm.com/knowledge/consulting.html

IN-SITE: *Lessons from Leading Users*

Sanwa Bank pushing financial services to the Web

BY ELLEN MESSMER

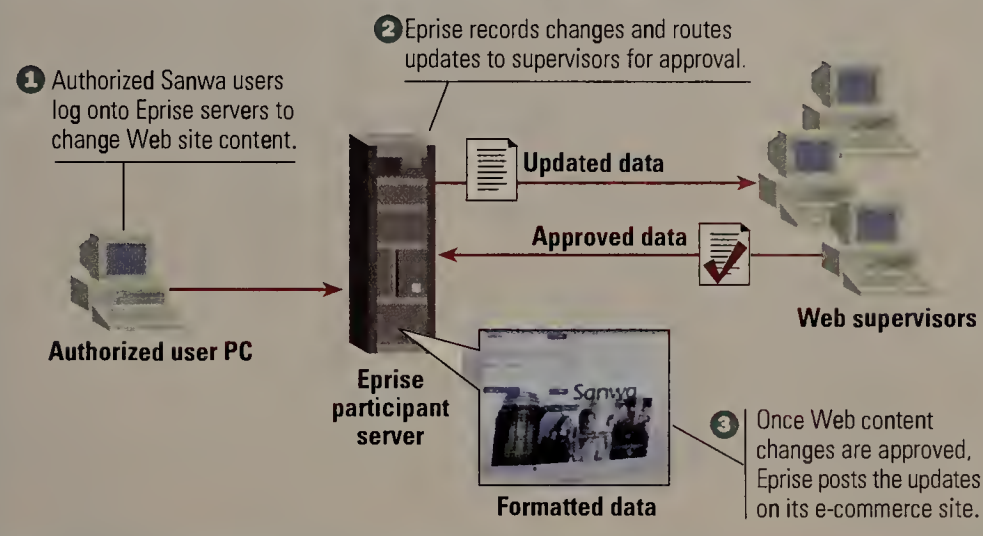
Slow to join the race to provide Web banking services, Sanwa Bank of Japan plans a sprint forward this spring with new online brokerage and lending services for its commercial and retail customers in the U.S.

The third-largest agricultural lender in the U.S., with a focus on California, Sanwa operates 107 brick-and-mortar branches in that state. Sanwa has $9.3 billion in assets, with commercial banking offices in New York and Chicago. But despite its size, it has only watched from the sidelines as other financial firms set up increasingly complex operations on the Web.

But that has to change for the bank to compete in an age where e-commerce is becoming the norm, says David Espenschied, first senior vice president for Sanwa's Web Banking Business Unit. Espenschied joined the firm last month from Countrywide Home Loans, where he was CEO of its Electronic Business Division.

Sanwa banks on Eprise

Using an Eprise Participant Server for distributed content management, Sanwa Bank hopes to maintain accurate and timely HTML content for customer transactions.



"We are behind our competition, but we intend to be a fast follower," Espenschied says, noting Sanwa's Web site today remains primarily informational rather than transactional.

Espenschied and Mona Chui, vice president and manager of the emerging technology section at Sanwa, are organizing the push to present a

See **Sanwa**, page 38

NetIQ takes analytical approach to Exchange mgmt.

AppAnalyzer designed to reveal usage patterns and activity in messaging environment.

BY JOHN FONTANA

See Exchange run. See Exchange perform. See Exchange analyzed.

NetIQ hopes Microsoft Exchange administrators can do all those things with its new AppAnalyzer. Released last week, the Web-based analysis and reporting tool goes under the covers of Exchange messaging and collaboration servers and produces data such as traffic patterns, message delivery times, attachment names and formats, and the size of mailboxes and public folders.

The tools are designed to give Exchange administrators a detailed and historical look at the usage patterns and activity in their Exchange environments. Companies such as Promodag and Hypersoft have similar tools for analyzing Exchange servers.

AppAnalyzer works by stitching together data from every Exchange server in an organization.The software goes beyond collecting data from message tracking logs and looks at storage, message gateways and server events.

"The biggest challenge for us has been reporting meaningful information about our Exchange e-mail services to senior management," says Cathy Partridge, systems analyst for the City of Edmonton in Alberta, Canada."We had to use custom-written scripts and go through a lot of work to get the reports that AppAnalyzer gives you." Partridge says not only have the accuracy and depth of the reports increased, but also her workload has been reduced."It used to take me an entire day to run the monthly reports. Now it will take a couple of hours to check the data the software collects automatically."

AppAnalyzer automates what has been a very manual task for administrators. In Exchange, performance data is stored in many locations and is not eas-

See **NetIQ**, page 38

NetIQ,
continued from page 37

ily collected using native tools. Data must also be collected server-by-server, and users must convert the data into a usable format before dumping it into another program for analysis.

AppAnalyzer automates the process. It runs on its own Windows NT or 2000 server, and once connected to the network, the software automatically discovers all the active Exchange servers. Administrators then set intervals to automatically suck data into a SQL Server, which aggregates the data for reporting.

Using online analytical processing tools, users can slice and dice the data with any of the 80 preconfigured reports that ship with the software.

Those reports include delivery times for any message or group of messages, message size, mailbox size and rankings of users with the heaviest usage. Custom reports also can be written.

Users can produce dynamic reports that reflect real-time data or static reports for posting on company intranets.

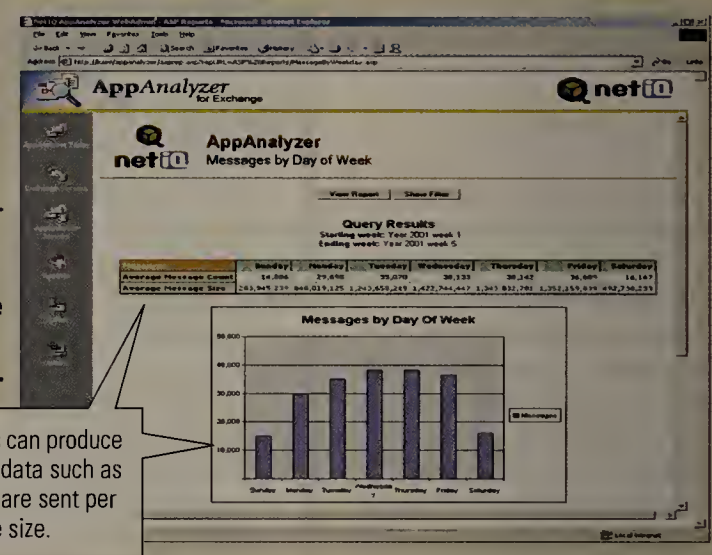
"Our reports allow you to be more proactive about how Exchange is being used and head off trouble before it is noticed by end users," says Chris Williams, director of messaging products for NetIQ.

AppAnalyzer is currently shipping and supports Exchange 4.0 and higher. It is priced at $600 for 100 users. The WebAdmin console is priced at $2,500 for up to five users.

NetIQ: www.netiq.com

Under a microscope

NetIQ last week released AppAnalyzer, a Web-based analysis and reporting tool for Microsoft Exchange messaging and collaboration server.



AppAnalyzer's reports can produce charts and graphs on data such as how many messages are sent per day and their average size.

Sanwa,
continued from page 37

broad array of the bank's financial services on the Web in a matter of months to meet customer demand for online services, including investment banking, lending and account management.

Several Sanwa Bank departments administer these financial services today, and one of the main challenges, Chui says, is finding a way to let business managers control how their individual departments will post content to the Sanwa e-commerce site.

Sanwa elected to use a distributed Web content management tool from Eprise. While Espenschied declines to name competing document management tools that were evaluated, he says the Eprise Participant Server did well during tests in its ability to process data transmitted from multiple back-end databases and application servers.

"We need to be able to post content in several ways," Chui says. "We need to allow 15 to 20 departments to use it, and Eprise allows us this distributed content management both dynamically and manually."

On the corporate LAN behind the Web server, Eprise can be automatically set up to periodically publish content from Microsoft or Oracle back-end databases to the Web server. With Eprise Participant Server, changes to HTML pages can't be posted on the Web server for public viewing until supervisors approve them, which is done through an e-mail notification that contains a hyperlink to the HTML changes.

Through e-mail-based workflow, Eprise lets any number of supervisors view the proposed changes.

Sanwa Bank's Mona Chui and David Espenschied are helping organize the e-commerce effort for the company.

Right now, Espenschied and Chui are ensuring that Sanwa employees responsible for managing Web content creation are trained in using Eprise, which costs about $200,000. Systems integrator Corillian has been enlisted to assist in the business-to-business application development.

When it's ready to go later this spring, Espenschied says, Sanwa Bank will be in the running to provide interactive brokerage services, investment banking and retail online banking. ◪

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mobile business

'Net Insider . Scott Bradner

IF YOU SEND ME MAIL, MAKE IT PLAIN

I don't know why people think I need to see their name in bold when they send me e-mail. Or why they think I'll be impressed if they have a logo on their electronic stationery. Unless someone is sending me a picture, I wish the person would stick to plain text e-mail. I've felt this way for a while on general principles, but now a number of security problems are strengthening my opinion.

Multi-purpose Internet Mail Extensions (MIME) is an annoying standard. The use of Internet Engineering Task Force MIME e-mail between consenting adults is fine. It's a useful way to send a picture of the family to grandma. But unless the sender knows what software the receiver uses, MIME can be a way to standardize the transmission of gibberish. If you send me a perfectly standards-compliant MIME message containing an AutoCAD drawing, you have sent me standards-compliant gibberish because I don't have AutoCAD support on my machines.

MIME is also a way to standardize the transmission of maximally inefficient messages. It's not all that unusual for me to get a message of more than one million bytes whose useful content is less than 200 characters. The rest is Microsoft Word overhead and fancy stationery complete with multicolor logo and a list of corporate management. It sure is pretty, but it's no more informative than just sending the 200-character message by itself. Getting such a message does not put me in a cooperative mood, especially if it just took me 10 minutes to download it to my desktop in a hotel room. Transmission efficiency is higher if the message is in HTML (the Web protocol), but unless you are using a Web-based mail reader — which I do not — the message looks like a newspaper that was used to wrap up an order of fish and chips.

So for message size, software compatibility and message readability reasons, I've always asked people to send me plain text e-mail. But now there is a growing number of privacy and security reasons to insist on it. MIME-transmitted Word files can be full of viruses, executables can destroy your disk and HTML messages can tell the sender when you open the message and even send a copy back to the sender of any comments you might add when forwarding the message to someone else. None of these problems occur if it's a plain text message.

It's particularly annoying that many e-mail packages come preconfigured to be in abuse mode, and it can be hard to figure out how to tell them not to send pretty messages. Finally, to me it's a sign of ignorance or arrogance to send nontext messages to mailing lists. The sender is implicitly assuming that all list subscribers use the same software they do and that they all want to waste download time.

Disclaimer: Ignorance, arrogance and Harvard do not generally go together, so the above is my own opinion.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Technology Update

An Inside Look at the Technologies and Standards Shaping Your Network

Ask Dr. Intranet

By Steve Blass

What protocols come into play when a user tries to access our intranet LAN through our Internet VPN using a wireless device like a PDA or mobile laptop? What hardware is required to connect these devices?

Mobile laptops can use wireless TCP/IP connections to connect to your intranet through an Internet VPN the way you would expect a wired connection to work. The only special hardware is the wireless connection for the laptop. Some services use PC Card wireless modems to provide a network connection, others use your cell phone like a modem. All this looks like a regular LAN or dial-up connection to your computer, even though there are many networks and protocols at work to provide the connectivity. Speeds can range from 9.6K bit/sec using cell phone dial-up to 144M bit/sec and up on some urban wireless networks. You can do some research to find out who provides coverage in your regions.

Wireless PDA connectivity into your intranet through a VPN depends on the types of PDAs you want to support and the type of VPN gateway you're using. You may need to provide a PDA gateway on your Internet Web site to handle communication through the VPN to your intranet. Columns from last April, May and June in the Ask Dr. Intranet archive on www.nwfusion.com contain basic Wireless Markup Language site support information for Wireless Application Protocol devices.

Blass, a network architect at change@work in Houston, can be reached at drintranet@changeatwork.com.

Gateways enhance TCP over satellite

BY D.C. PALTER

Satellites are an ideal way to provide Internet connectivity to locations that lack adequate terrestrial infrastructure. Fleets of telecommunications satellites can provide network access to nearly every point on the globe, and new generations of satellites will soon multiply the amount of bandwidth in the sky.

However, while TCP/IP was specifically designed to operate over any type of network infrastructure, the response of TCP to conditions found on satellite links can severely restrict throughput over the links.

Fortunately, new products known as protocol gateways, or performance enhancing proxies, can overcome the limitations of TCP.

The conditions on satellite networks that restrict the speed at which TCP can transmit data include:

- Latency: Geosynchronous satellites orbit at an altitude of 22,300 miles, resulting in a round-trip time of approximately 540 milliseconds for a single satellite hop. Without the tuning of TCP parameters, the typical receive window size of 8K bit/sec sets a throughput limit of only 120K bit/sec per connection.
- Bit errors: TCP assumes that data loss is caused by congestion on the network, making TCP extremely sensitive to the level of packet loss that naturally occurs over satellite and other wireless links.
- Asymmetric bandwidth: For economic reasons, satellite nets often combine a large forward channel with a narrow return path. However, if the asymmetry is too great, the return path can become a performance bottleneck.

One partial solution is to tune the TCP stack on the end hosts, and utilize advanced TCP options such as window scaling and selective acknowledgments. However, this is frequently not practical as it requires a TCP/IP stack on every end host that supports these options, as well as modification and tuning of TCP parameters that are obscure to the general user.

Rather than changing the end nodes, protocol gateways work by intercepting TCP connections, transmitting the data over a satellite-optimized transport protocol, then establishing a new TCP connection on the other side of the satellite link.

The TCP connection is thus split into three connections: a TCP connection between the client and remote-side protocol gateway, a satellite-optimized protocol connection between the two protocol gateways, and a TCP connection between the server-side protocol gateway and the server. Because protocol gateways communicate with end hosts using standard TCP, these systems can be designed to be entirely transparent to end users.

Using a protocol designed to operate efficiently under the long latency, high loss, asymmetric bandwidth conditions of satellite links, and taking advantage of the single path and known, fixed bandwidth and delay characteristics, protocol gateways can fully utilize the available bandwidth. While satellite protocol designs can vary, common elements include:

- Large windows: To avoid throughput limitations due to the receive window size, satellite protocols use large windows, based on known link bandwidth and delay parameters.
- Rate control: The protocol gateway transmits data at exactly the known, fixed link bandwidth, maximizing throughput and avoiding data loss due to congestion.
- Negative acknowledgements: With only one path across the satellite link, gaps in the packet sequence indicate data loss, and negative acknowledgements can be used to immediately signal for retransmission of missing data. This also reduces the frequency with which regular acknowledgements are required.
- Data compression: Protocol gateways frequently include data compression functionality to further maximize the throughput over the satellite link.

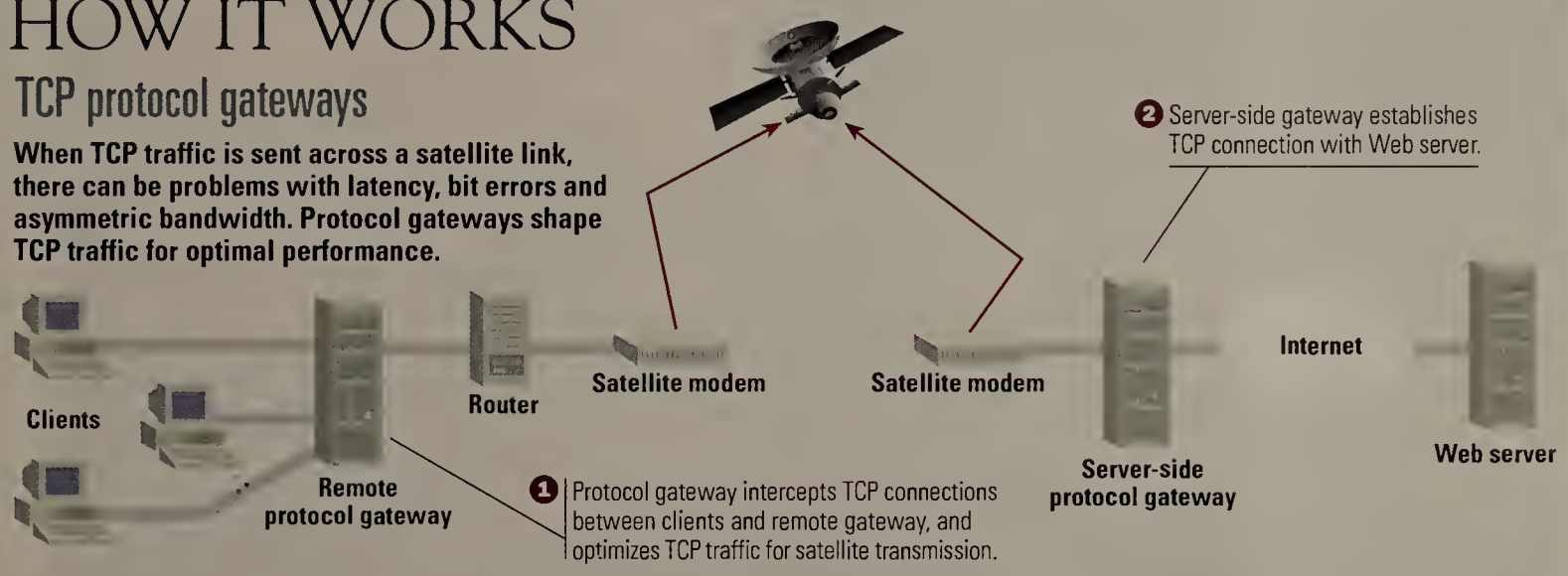
The primary benefit to end users is terrestrial-like download speeds for Web browsing, e-mail and other TCP applications. Although protocol gateway implementations vary greatly, one test over a 10M bit/sec link showed single-connection file transfer rates increased by a factor of nearly 100, and multiclient Web traffic throughput increased by three times.

Palter is vice president of Mentat. He can be reached at dc@mentat.com.

HOW IT WORKS

TCP protocol gateways

When TCP traffic is sent across a satellite link, there can be problems with latency, bit errors and asymmetric bandwidth. Protocol gateways shape TCP traffic for optimal performance.



Got great ideas?

Network World **is looking for great ideas for future Tech Updates. If you've got one, and want to contribute it to a future issue, contact Features Editor Neal Weinberg (nweinberg@nww.com).**

Gearhead . inside the network machine . Mark Gibbs

RECURSIONS, ITERATIONS

Last week we had planned to discuss the obscurata of Domain Name System referrals but we ran out of space. So this week, referrals ahoy. But before we launch into the raging seas of how this works, we need to explain what a referral is: When a resolver (that is, a DNS client) requests a DNS server to translate a name into an IP address (or vice versa), the server either answers with the correct information or refers the query to other servers.

So let's say the resolver asks for "marchhare.wabe.gibbs.com" to be resolved, and the default DNS server (we'll call it "Server One") doesn't know the answer. The standard method is for Server One to query the root DNS server for the answer.

As the root server only knows the server that handles the ".com" part of the request, it replies with the ".com" server's address.

Server One then queries the ".com" server for what it knows about the request. The ".com" server refers Server One to the DNS server handling the subdomain "gibbs.com."

That server may know the answer, in which case the query will be answered, or it might only know the "wabe.gibbs.com" part and refer Server One to a server that is authoritative for the zone that includes "marchhare."

For subsequent queries to the "gibbs.com" domain, Server One now has some useful information cached so it can skip going to the root and ".com" servers. So to resolve "redqueen.wabe.gibbs.com" there will be two fewer steps — Server One will first query the DNS server responsible for "gibbs.com." Indeed, the same applies to all the DNS servers that Server One might query — they all improve their knowledge about where to find authoritative servers for different zones as they are used more and cache more answers.

Anyhow, the request the resolver makes of the first DNS server it talks to is called a "recursive query" for obvious reasons — that server has to keep asking other servers until it succeeds in resolving the request or fails completely.

The query Server One makes of the other DNS servers is called a "nonrecursive" or "iterative" query.

Gearhead is sure the question on your lips at this point is, "Couldn't that DNS server have made a recursive query?"

The answer is "Yep," and doing so would make the other DNS server do all the grunt work. This kind of impolite behavior is not the norm on the Internet, and a DNS server that does so is called a "forwarder."

That said, there are situations in which you would use a forwarder. For example, if your Internet connection were slow or overloaded, it would make sense to use a forwarder to reduce the traffic on the link by avoiding all the recursive DNS queries. Another situation would be where a connection with high latency, such as a satellite link, is being used. Forwarders are also useful for architecting networks with firewalls, but that's a separate topic we haven't space for here.

We've covered how resolvers and DNS servers talk to each other, which just leaves the question of what they talk about — the topic of next week's magical technical mystery tour.

Your itinerary to gearhead@gibbs.com.

Management Strategies

Career Development, Project Management, Business Justification

Ready, set, go solo

BY JOHN ROSSHEIM

Do some prep work before declaring yourself a free agent.

CHRISTIAN CLAYTON

Maybe you've had it with the corporate IT world. Or maybe you yearn to become a sought-after independent network consultant. Either way, if you want to be your own boss, you've got a lot of things to think about before you up and quit your day job. Here's help.

1. Research your market niche

Do your skills as an employee translate into marketable consulting services? Do your homework by calling recruiters specializing in contract gigs, sounding out potential clients and drilling down into the listings on generalist and IT-specific online job boards.

There's a range of contracting opportunities available to network pros, according to Rick Freedman, author of *The IT Consultant: A Commonsense Framework for Managing the Client Relationship.*

"If somebody has a deep enough grounding on the technical side he can sell those skills as a tech-for-hire," says Freedman, who runs his own consulting business out of Lenexa, Kan.

2. Ride the trends

Network security skills are much sought after in 2001, Freedman says. On the business side, IT departments are looking for consultants who can optimize the mix of insourcing and outsourcing for complex network projects.

Recruiters and network consultants agree that some of the best opportunities are in wide-area networking. "Our clients are looking for high-end engineers who can do a blueprint for a 2,000-location WAN, for example," says Margaret Langsett, executive vice president at Virtual Corp. in Flanders, N.J. Voice and video over IP are also hot, she says.

3. Contemplate your work/lifestyle balance

Once you unleash yourself into the world of consulting, you'll be consumed with pleasing clients, keeping the books, marketing yourself and attending to a million other details. So now is the time to think about the big picture. Is your chief goal to triple your pay, or are you ditching the corporate grind to get more face time with the family?

Get specific about how many hours you want to put into the business each week, how many of those hours you'll actually be able to bill for, and how many weeks you want to work each year. The results of your analysis will be a key input to your next task: pricing.

4. Set your fees

To optimize profits, you've got to see what rates the market will bear. But first you'll have to figure out what you need to gross to make ends meet.

Langsett, who counsels IT folks embarking on contracting careers, offers this rule of thumb: "Take annual salary plus bonus, add something for health insurance, then add another 30% to tide yourself over between gigs. Then divide by 2,000 to get the hourly rate."

Independent consultant John Talkington charges $125 per hour, the same rate his employer was charging when he left to found Apex Network Solutions in 1998. Talkington usually bills 24 to 28 hours per week serving the LAN and WAN needs of small and midsize businesses within striking distance of his office in Carrollton, Texas.

After you've logged a few projects, consider charging a flat fee instead of an hourly rate. That way, the more efficient you get, the more money you make.

5. Don't forget benefits

Buying your own benefits comes with the free-agent territory. Yup, that's a big ouch. At a minimum, you should plan for health and disability insurance, and regular contributions to retirement savings.

Consider joining a professional association that gives you access to group rates on insurance. The savings on premiums might pay for your association membership, and then some.

Secure coverage before you quit your day job. You may be able to buy insurance at group rates through your company for up to 18 months after you leave, thanks to COBRA. Also consider buying a noncancelable disability policy while you've got a corporate connection; otherwise, you might have to wait for years to get covered as an independent.

6. Assemble your infrastructure

One challenge of transitioning from traditional employment to consulting is that you need to put forth a professional image as soon as you start networking for contract opportunities. This means you can't annoy prospects by e-mailing them your resume as a vintage 1994 WordPerfect attachment or by letting your 2-year-old answer your business phone.

Talkington set up his home office for less than $10,000, with purchases including a reasonably powerful laptop, Microsoft Office and other business software, plus basic office furniture. You'll also need a voice phone line and high-speed Internet access.

What's more, you should seek the counsel of an accountant and a lawyer about tax strategies, contracts and so on. As your clients will hopefully learn, good professional advice can pay for itself many times over.

Rossheim is a freelance writer in Providence, R.I. He can be reached at rossheim@home.com.

INDEPENDENCE DAY

Interactive quiz: Do you have what it takes to become a free agent?

What to charge: Database of IT consulting rates.

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Editorial

A few thoughts from NW's WAN seminar tour

I just got back from the West Coast swing of Network World's State of the WAN seminar tour and thought I'd share some of what I learned (see www.networkworld.com/events.htm for information about upcoming events).

This WAN seminar is led by Jim Metzler, vice president of Ashton, Metzler & Associates, a consultancy in Newton, Mass., with stand-in roles by yours truly and my colleague John Gallant. Gallant and I get to do the fun stuff: solicit questions from the audience to pose to the vendor panel.

To frame the discussion I typically ask the audience what they're interested in. In Seattle, San Jose and Dallas, roughly 60% raised their hands for VPNs, 50% for quality of service (QoS) and 40% for managed services. Surprisingly, only about 20% cared about the broader subject of convergence.

Why all the interest in QoS when interest in convergence is so thin? Because of hard-to-predict Web traffic. One speaker said he knows a shop that discovered that 70% of its WAN traffic was to and from the Web. It's hard to safeguard mission-critical applications in that kind of environment without QoS.

Conventional wisdom says QoS is only as strong as the weakest link, meaning a single nongated link can flood a network. But it's possible to implement QoS on isolated links or, as Metzler puts it, where you are experiencing the most pain.

Ultimately, though, the vendors argued that organizations will need some kind of robust QoS framework to get the most out of their WANs. The trick, Metzler says, is to keep it simple: For the sake of manageability, only identify a handful of service classes.

When the conversation turned to VPNs, one topic that kept coming up was Multi-protocol Label Switching (MPLS). Some carriers are promoting the fact that their services are based on MPLS, implying they have built-in QoS capabilities. But the panelists said that isn't a given, so do your MPLS homework before entering any contract negotiations.

The majority of the audiences in all three cities are already using dial-up VPNs, and 25% say they are now starting to use high-speed VPN connections to link corporate sites. Metzler says that trend will gather steam as the year wears on.

Let me know about the WAN trends you're watching.

—John Dix
Editor in chief
jdix@nww.com

Message Queue

Ready for rollout?

Regarding your Face-off on whether Windows 2000 is ready for full rollout (www.nwfusion.com, DocFinder: 3036):

Nelson Ruest seems as if he lives in a world where budgets are plentiful, people are well-trained and IT departments are going all-out to be the first to have Windows 2000 as a major part of the infrastructure. I'm sure this world exists, but I don't believe it represents most of the general public.

Robert Newman
President
Desktop Services
Paramus, N.J.

I am planning on a full rollout of Windows 2000 — not because I enjoy inflicting more pain into my life than is absolutely necessary, but mainly because the reality of the situation dictates this to be an opportunity for growth and knowledge.

Yes, we all must change. It was difficult to go from high school to college. It was difficult to go from college to a family and kids. News flash, Sparky: This is the real world, where things change rapidly. It was difficult to go from 3.1 to NT, 3.11 to 95, and it will be just as difficult to go to Win 2000. Get over it, and grow up. Those who are moaning about Win 2000 are the same people who moaned about the conversion to 4.0, said Linux was not a viable option, claimed Yahoo was a "start-up without possibility and doomed for failure" and probably also have an AOL account.

Remember what the venerable Will Rogers said: "Even if you're on the right track, you'll get run over by the train if you stand still."

Randall Mitchell
IS director
Aztec
Peoria, Ariz.

I'm currently working toward Microsoft Certified Software Engineer certification in the Windows 2000 track. It's a fascinating operating system with endless possibilities. However, as Jeff Allred points out in his Face-off column, the training is quite extensive and time-consuming. I cannot imagine how a company would be able to train its IT force — and subsequently its users — properly without shutting down operations for a couple of months. Obviously I'm being facetious, because many businesses have successfully deployed Win 2000, but the training budgets must have been huge to accomplish such a Herculean task.

I can see where Novell and NT loyalists are coming from: After all, why change something if it isn't broken? I think that's the bottom line here. If a company has the money to invest in converting to Win 2000 — and has a proper plan in place — then more power to it. But to convert just for the sake of converting, especially if your network is already running smoothly, seems like it would simply be a case of trying to keep up with the Joneses.

Brian Sanger
Upper Montclair, N.J.

Pleased with PHP

Thank you for Mark Gibbs' excellent series of Gearhead columns on PHP (www.nwfusion.com, DocFinder: 3027). Much of what is written about IT is of marginal merit, but a tutorial such as this one has great value. I have looked forward to each installment.

Wayne Lange
McLean, Va.

Digital is profitable

In the column "Cabletron split-up: One year later" (www.nwfusion.com, DocFinder: 3037), I was surprised to see Digital Networks described as a "nonprofitable business unit." In fact, Digital Networks was then, and still is now, a highly profitable business. Cabletron had reasons for selling the Digital Networks business, but the profitableness of the product line was not one of them.

Lee Knoch
Vice president of marketing
Digital Networks
Andover, Mass.

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, *118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.*

In the Works . Paul Hoffman

NAPSTER IS WRONG POSTER CHILD FOR PEER-TO-PEER NETWORKING

The recent federal appeals court decision against Napster is a setback for promiscuous copyright violation. But it is not an indictment against the usefulness of peer-to-peer enhanced networking. Industry pundits who claim that Napster started the trend in peer-to-peer resource sharing not only misunderstand the history of the Internet, they also inappropriately link a service that is primarily used for stealing music with personally controlled systems designed to help distribute content created by individuals.

Let's start with a few facts: Napster is primarily used to distribute music from commercial CDs. This holds true even for popular performers whose concerts are illegally recorded and the tapes traded in the bootleg underground. If you don't believe it, get a Napster account and search around for yourself. Even in the "gray areas" of the music world, Napster is used primarily for simple music theft. How did the peer-to-peer system business arise from a swamp like this?

The "Napster-alikes" that have sprung up generally have no better intentions than Napster. The Napster-like programs that allow swapping files other than music quickly became little more than pornography-trading zones. It is yet another ugly swamp that seems almost unredeemable.

But peer-to-peer is too good an idea to leave to the folks who want to just steal and ogle. Given that the Internet was pretty much started by individuals swapping files from their own computers or allowing file swapping from their parts of shared computers, peer-to-peer clearly has more promise. Lotus Notes was a pioneer in letting systems administrators centralize file sharing or letting users do it themselves in a controlled manner, and many workflow and collaboration systems did much the same.

Clearly, peer-to-peer file sharing is nothing new. To make it useful, you need to add a few features, such as an easy way for users to find the information they need from any of their peers. Even with that, there's not much value to doing this on a user-by-user basis. That's why most IS departments choose to centralize corporate information: They can easily control who has access, how the information is organized and who can update it. New products jumping on the peer-to-peer bandwagon go much further than file sharing, of course. Some of them include instant messaging and chat, collaborative searching, shared text and white board discussions, mailing lists and so on.

Basically, peer-to-peer software takes all the features we have learned to love and puts them on end-user machines instead of central servers. Is this a good thing? The trade-offs have not changed in 30 years: Central administration helps organize groups and stifles individual communication. The latest wave of business peer-to-peer software simply brings up the centralization debate yet again. Fortunately, there's no need to talk about stolen music and porn in that debate.

Hoffman is director of the Internet Mail Consortium and the VPN Consortium. He can be reached at phoffman@imc.org.

Reality Check . Thomas Nolle

JUST HOW LOW CAN CISCO GO?

For the first time in nearly a decade, network superstar Cisco failed to meet Wall Street expectations. Cisco stock in the 30s seemed impossible just three months ago, and now Cisco stock in the 20s seems very possible — even likely. What's wrong? How far can Cisco fall? More significantly, what does its fall say about the future of our industry?

Why is Cisco not meeting expectations? Because connectionless routing isn't growing as fast as it has been, and because its slower growth can no longer sustain Cisco's growth expectations. Why is connectionless routing not growing as fast as expected? Because the Internet isn't a very profitable carrier service business, and ISPs can't continue to expand their networks without any clear indications they'll be profitable selling Internet services.

How far Cisco might fall is a little harder to say. Based on the company's next three years' potential, I think its stock should be about $28 per share. Wall Street tends to punish firms that disappoint it, though, and we could see Cisco fall much further — maybe as low as the $25 level. The problems Cisco has had with sales and earnings won't be solved in the next quarter, and probably not this year because Internet and IP spending on the enterprise and carrier levels won't grow much in 2001. Cisco has the majority of the router market, so getting market share from somebody else isn't much of an option — only growth of the market can increase Cisco's numbers.

That brings up the real issues the Cisco announcement poses for the market. First, can the network market overall do well if the poster child of networking is doing less than well? Second, have we expected too much from IP and convergence? The answers, respectively, are "no" and "yes."

Cisco's problems are IP and the Internet's problems. Don't look for good news anywhere in that area if it doesn't come from Cisco. As IP goes, so goes optical. There can be no more of a baseless and naive position in all of networking than the view that optical networking is exploding while Cisco earnings fall short. We really need to assume that a Cisco shortfall translates to an industry shortfall. Later this spring or early summer, we can expect to see a major shakeout in the optical market, and a lesser one in networking overall.

So what really brings in the network bucks? During the next three years, carrier spending on capital equipment must focus on two areas: creation of broadband access facilities (particularly to residential users) and creation of profitable data service extensions to existing data services. In the first area, the key products are next-generation fiber remotes capable of voice/DSL service support. Cisco has no strength there and needs some. In the second area, the key product is the so-called "service switch." Cisco has no strength there, either. Because service switches are a kind of router successor product, Cisco may resist even admitting to their value.

Broadband Internet won't make money. Wireless Internet won't make money. Non-Internet IP services already make money, as do frame relay, transparent LAN and other corporate data services. We need to expand the range of the proven data services, introduce "business IP" to replace "business Internet" and figure out how to make a profitable data service for residential users. The first step in accomplishing these goals is to admit that the Internet and connectionless routing alone is not the answer to our market prayers. That's the hardest pill for Cisco to swallow, but one it must swallow if it's ever to return to its former luster.

The market at large will have to swallow this same bitter pill to prevent the Cisco slip from becoming a marketwide collapse. We've somehow made the Internet into a constitutional right and not a business. As a result, we've forgotten the problems with Internet profitability and ignored the question of how a market segment that isn't making money can continue to spend it on new equipment. Cisco, and the industry, needs to back not a technology but a revenue paradigm — one that's real and not just hoped for. The Internet isn't it.

One of Cisco's commercials claims that voice — more than 80% of today's service provider revenue — will be free in the future. Show service providers the profit source that will replace it, and Cisco and the rest of our industry can stop the stock price and confidence slide in its tracks.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (856) 753-0004 or tnolle@cimicorp.com.

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E-commerce sn't an iceberg, but a lifeboat

The tides of perception have turned 180 degrees concerning e-commerce. A year ago, every company that had a Web site was clamoring to pronounce itself a dot-com. Today, that label floats like a rock.

But receding floodwater does not equate a drought. Sure, many e-businesses not rooted to traditional business rules washed away last year. But the e-commerce infrastructure you are deploying remains the spring for watering your thirsty business. It's just that a business can't exist on e-commerce alone. It must also be nourished with a sound business plan, loyal customers, profits and great networks.

In this, our third annual Electronic Commerce Issue, we guide you past the wreckage. We've documented e-commerce mistakes and how to avoid them. We've got tips for determining return on investment, building never-fail Web sites and catching the next wave — mobile commerce.

Our E-comm Innovator of the Year award winner, trucking firm ABF Freight System, shows that e-commerce's true role is better customer service. The firm did that while reducing costs through an integrated, more efficient backbone. Likewise, we've developed a blueprint for creating two common types of extranets, and we've pinpointed how to solve one of e-commerce's trickiest security problems, certificate validation.

We've enlisted even more navigational help for you on our Electronic Commerce minisite on Network World Fusion (www.nwfusion.com/ecomm2001). You'll find downloadable checklists on m-commerce and extranets, advice on e-commerce IT project management and a Buyer's Guide of e-commerce outsourcers.

Bon voyage!

— Julie Bort
Executive editor, Signature Series
jbort@nww.com

THE Signature SERIES

The Electronic Commerce Issue is one of six bimonthly supplements that examine the biggest trends shaping the networked world. Next up: our annual check-up on the health of the network industry, the Network World 200 Issue, coming April 23.

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Cover design: Steve Ditko

More online

We've augmented our Electronic Commerce Issue with additional stories, downloadable tools, an interactive Buyer's Guide and more online. Head to the Electronic Commerce minisite on Network World Fusion at www.nwfusion.com/ecomm2001 for . . .

- A comprehensive, interactive Buyer's Guide on e-commerce outsourcers. From catalog maintenance to full-service hosting, plug in your needs and we'll provide you with a list of outsourcers. **DocFinder: 3121**
- A roundtable discussion, in text and RealAudio versions. We gathered three e-commerce project management experts and picked their brains on how best to manage fast-paced, e-commerce IT projects with high security risks. **DocFinder: 3122**
- A downloadable checklist on extranets. What are the key decisions for choosing one kind of data link over another? Our checklist will act as your guide. **DocFinder: 3123**
- A downloadable checklist on mobile commerce. Should you be developing an m-commerce site now or wait? And how will you pick the right vendors? Our checklist guides you through these tough decisions. **DocFinder: 3125**
- A roundup of exemplary e-commerce projects. Only one company can be *Network World's* annual E-comm Innovator of the Year Award recipient, but many more gained our applause. Check out our honorable mentions. **DocFinder: 3127**

Plus, stories on middleware security **(DocFinder: 3124)** and business-to-business procurement software **(DocFinder: 3126)**.

"Linux is so totally dreamy!"

WHY *LINUX* HAS MORE FANATICAL DEVOTEES THAN A TEEN POP IDOL.

FIRST ELVIS PRESLEY. Now Linus Torvalds. One used his hips to create a worldwide frenzy. The other used the arguably less sexy but equally effective concept of open standards. When Torvalds created the new Linux operating system, he took the "what's mine is mine and what's yours is yours" world of proprietary software and turned it upside down. The result? A true software meritocracy where anyone can share, refine and customize code that's open and available for all.

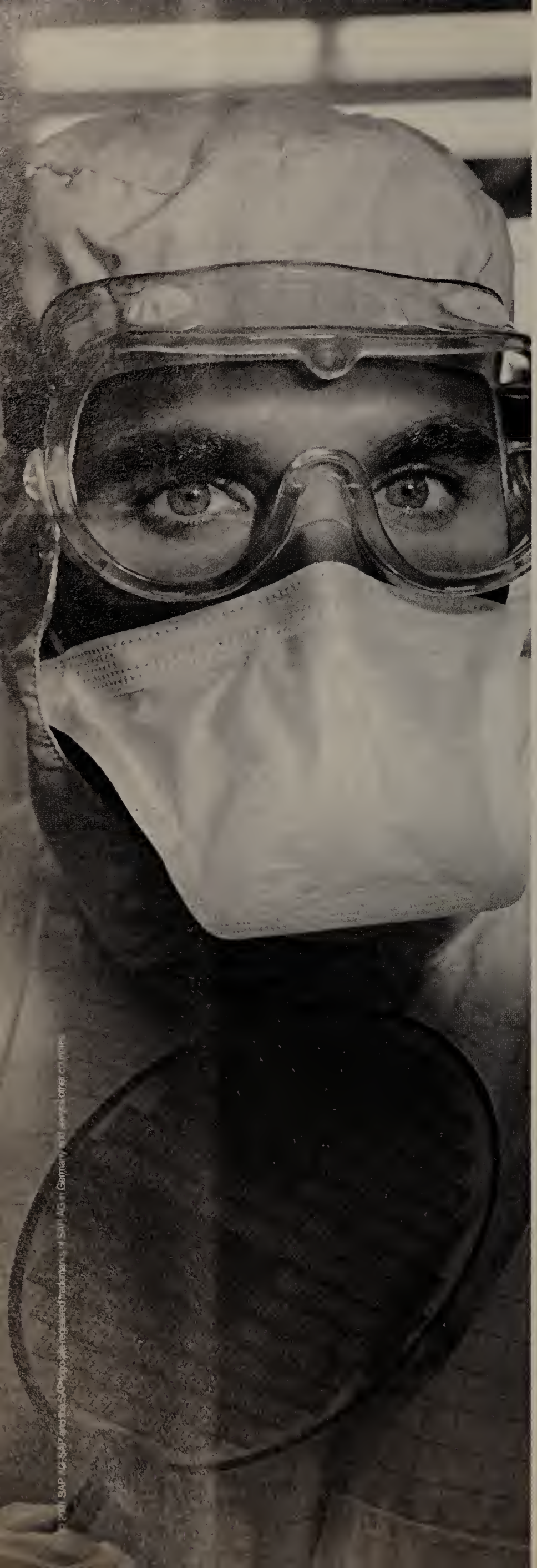
What does this mean for business people? It means that new e-business infrastructures can be rapidly adapted to particular business tasks. Companies will no longer be forced to adjust their processes to the only software available. Since Linux® is now the fastest-growing and most accessible operating system, it's where the best technologies will be created and arrive first, and where the greatest number of skilled staff and technicians will appear now and in the future. Linux is hardware-agnostic, so it can quickly begin to remove the massively cost-intensive task of integration across disparate platforms. These aren't just software advantages; they are real bottom-line business advantages: reduced costs, faster time-to-market, clear competitive edge, flexibility.

Now the Linux community has a powerful, perhaps even unexpected, ally in IBM. The people at IBM have embraced Linux as a pillar of e-business and are committed to helping it grow through new technology, devoted specialists and active support to the entire Linux community. From across-the-board Linux enablement of IBM servers and software, to thousands of dedicated Linux developers and technical support experts, to porting centers where IBM Business Partners can test and refine their applications for Linux, IBM is backing Linux wholeheartedly.

Proof? Linux specialists at IBM Global Services recently helped Telia (Scandinavia's largest telecom and Internet service provider) consolidate a complex infrastructure of multiple UNIX® servers into one mission-critical, Linux-optimized IBM @server. One server capable of hosting more than 1,500 virtual Internet Linux servers simultaneously.

It's exciting stuff. And this is just the beginning. So if you think you can keep your composure, visit **ibm.com**/linux for more information.

IBM



OUR ONLINE SHOPPERS DON'T JUST "ADD TO SHOPPING CART." THEY "ADD TO FREIGHT CAR."

When an online book order doesn't show up on time, it's not the end of the world. But when you manufacture VLSI chips, and your supply chain grinds to a halt because 20,000 gallons of ammonia are missing in action, you've lost more than time. You've lost customers. SAP's Supply Chain Management solution — part of the mysap.com e-business platform — lets you collaborate with customers, partners and suppliers to keep your supply chain moving. Whether your customers order by the pound or by the ton. Learn more; type in www.sap.com

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Lou Russell, Cutter Consortium senior consultant; president, Russell Martin & Associates Consulting Services

JERRY KALYNIUK/MPG

Go online to read or listen to the full E-commerce roundtable discussion.

E-comm's biggest mistakes

The honeymoon is over for the dot-coms. But that doesn't mean your project is doomed — unless, of course, you commit these offenses. **BY ANN SULLIVAN**

RBANFETCH.COM ISN'T FETCHING for consumers anymore. Boo.com is a ghost of its former self. And Pop.com? Burst.

These are just a few of the dozens of Web commerce, content and services companies that shut down, reorganized or sold out last year. An estimated 210 dot-coms failed in 2000, according to Webmergers.com.

Failure hasn't been limited to the consumer market, either. Business-to-business companies such as B2bstores.com and EC Cubed have also washed away. Consolidation among business-to-business exchanges is anticipated, and reorganization is a popular escape. Ventro, which manages six e-marketplaces catering to the chemical and medical industries, is getting out of the e-marketplace-hosting business and refashioning itself as a software provider.

Many of the e-commerce companies that remain are holding down marketing budgets and shoring up business plans like homeowners preparing for a hurricane. At the close of 2000, evidence of inclement weather was all around:

- Venture capital investment in e-commerce companies fell 19.3% to $378.5 million in the third quarter of 2000 from $469.1 million in the second quarter, according to research firm VentureOne.
- Advertising spending by online companies dropped by about one-quarter, to $536 million in the first half of 2000 from $718 million during the first half of 1999, according to Competitive Media Reporting.
- The tech-heavy Nasdaq stock exchange fell from a high of 5,132 in March to a low of 2,523 in December.

In times like these, what can you do to protect your company's online endeavors? To start, the experts suggest avoiding these most dangerous pitfalls:

ILLUSTRATION BY CAREY SOOKOCHEFF

Customer service meltdown

Inadequate attention to customer service, whether by telephone or e-mail, is a surefire way to lose customers. When Gomez, an Internet benchmarking firm in Waltham, Mass., measured customer service at 79 online sites in its annual holiday season audit, the firm found 30% of customer service e-mails went unanswered and only 40% of questions were answered accurately. For phone inquiries, 63% of questions were answered accurately.

Inadequate order fulfillment

Stocking physical stores by the palette-load is one thing. Supporting single-unit online sales is entirely different. A company with a well-tuned inventory-management system for physical stores can't expect that same system to hold up for e-commerce sales, says Andrew Bartels, senior research analyst for e-commerce at Giga Information Group. The law doesn't leave much room for error. Last July, the Federal Trade Commission doled out fines totaling $1.5 million to seven companies — including Toysrus.com, CDNow.com and Macys.com — that missed shipment dates and failed to notify customers of shipping problems.

Use of primitive search and transaction tools

Seconds count in online shopping satisfaction. Last November, Internet performance monitor Keynote Systems measured the time to conduct a multistep Web transaction in several vertical markets. The fastest of the 12 apparel sites it benchmarked let visitors find an item in less than 10 seconds via cable modem/DSL speeds. The slowest sites took roughly 25 seconds.

Failure to globalize

This will be the year that international surfers outspend U.S. surfers, at $277 billion vs. $248 billion, predicts market research firm IDC. To compete, companies need to address a global audience, says IDC research analyst Rob Rosenthal. A start-up rushing to get online may postpone international plans, intending to work the kinks out of the business before expanding overseas. But that could give local competitors the edge.

Building community, not clientele

Placing too much emphasis on building a community instead of clientele is a short path to insolvency. One example is a health-related site where visitors may exchange information about a particular disease. "That's interesting, and it has value, but it doesn't always lead to cash flow," Rosenthal says.

Insufficient budgets

Deploying the Web site is just the beginning of a company's e-commerce expenditures. In a survey of 561 executives conducted by IDC, 54% said the initial cost to develop an e-commerce site is less than $100,000; with 14.3% putting the figure at $100,000 to $499,000; 5.7% at $500,000 to $999,000; 8.4% at $1 million to $5 million; and 4.3% at more than $5 million. The remainder didn't know.

But the site will continue to cost, with more than half of 565 respondents budgeting less than $100,000 for maintenance; 13% budgeting $100,000 to $499,000; 7.2%, $500,000 to $999,000; 7.4% $1 million to $5 million; and 5.1% more than $5 million.

Channel conflict

Don't bite the hand that feeds you. Companies often leap into Internet sales without considering their channel partners, says Giga's Bartels. Levi Strauss is an infamous example. It launched a site that sold jeans to consumers in November 1998 and angered its authorized retailers. One year later, Levi Strauss retooled the site and now refers consumers to its retailers.

Toy distributor Hasbro avoided such conflict with the launch of its direct sales site. It chose to market items that its retailers weren't interested in, or couldn't effectively resell: collectibles and online interactive games. Likewise, it directs visitors to its retailers' sites for the toys the retailers carry. ◪

A single route to e-comm

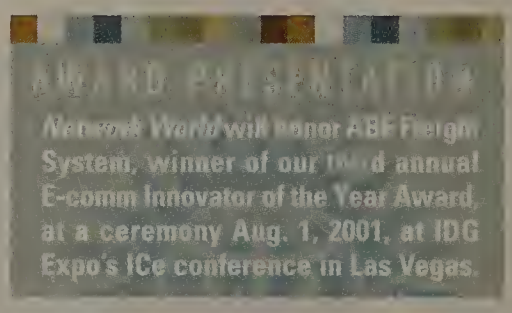
ABF Freight System wins *Network World's* 2001 E-comm Innovator of the Year Award with an elegant network design, truckloads of creative features and an open business philosophy. **BY JULIE BORT**

Network World's annual E-comm Innovator of the Year Award honors companies with extraordinary business-to-business e-commerce initiatives. These innovators have advanced the use of e-commerce technology while supporting business objectives. They have carefully considered business plans, intimate knowledge of their customers and, of course, strong technology underpinnings. This year, we honor trucking firm ABF Freight System for building a mainframe-based e-commerce infrastructure that enhances customer service and opens new markets.

INNOVATION IS EASY WHEN you start from scratch. If someone hands you a few million dollars in seed money to build an e-commerce infrastructure, you'd naturally use the latest and greatest technologies. But what if you work for a 65-year-old trucking company that relies on a mainframe? Could you best upstart dot-coms and traditional competitors in e-commerce features and functionality for years on end, without ditching those reliable, mission-critical mainframe applications?

ABF Freight System, a less-than-load (LTL) transportation company in Fort Smith, Ark., has wrapped an e-business infrastructure around its IBM 9672 R46 S/390 mainframe, saving more than $1 million per year in the process while providing a level of self-service never before available in its market. At the same time, e-commerce created a new business line and revamped virtually everyone's job, from how a regional vice president builds customer loyalty to how a customer service representative spends the day.

The same CICS and COBAL mainframe applications that ABF has long used to calculate pricing, trace shipments, schedule routes and review freight bills are now accessible via the e-commerce site, the intranet, Wireless Application Protocol-enabled (WAP) devices, imaging software, and even an old interactive voice response (IVR) system. ABF secures the transactions through what it calls the CICS Pipe, a custom-built protocol translation tool that wraps CICS around whatever front-end protocols an application uses.



Such integration contrasts sharply with the e-business norm: e-commerce technology silos built to jump-start Web efforts, but which now must be painfully integrated with existing back-end systems. Elegance in ABF's case stems from its e-commerce champions: IT folks.

With more than 14,000 employees, ABF earned $1.38 billion last year in operating revenue. As a wholly owned subsidiary, it represents the bulk of the ineome and profits of its publicly traded holding company, Arkansas Best, No. 772 on last year's Fortune 1000 list. ABF's e-commerce infrastructure, dubbed eCenter, boasts more than 23,000 registered users from more than 17,000 ABF customers. These customers generate more than 70% of ABF's annual revenue and shipment volume.

ABF has earned *Network World's* 2001 E-comm Innovator of the Year Award for serving as an example of old-to-new economy transformation.

Trucks and technology

LTL carriers such as ABF and competitor Roadway Express fill the niche between parcel carriers like Federal Express and full truckload carriers like JB Hunt that specialize in huge shipments. With the dot-com boom of 1999, competition also sprung forth from virtual companies, such as freightquote.com and Transportation.com.

LTL carriers ship general commodities in loads that would not fill a truck; their core customers are businesses, not consumers — although e-commerce has allowed ABF to move into at least one consumer market (see story, page 58). Prices are calculated for each shipment using variables such as weight, volume, distance and the number of boxes. To complicate matters, carriers unilaterally offer discounts on most shipments, making custom quotes the order of the day. That is the prime reason ABF e-commerce champion Bob Davidson, vice president of pricing and marketing, lobbied to integrate an e-business infrastructure when ABF began experimenting with the Web in 1995. ABF wouldn't have even been able to offer an accurate price to e-commerce customers without tapping into or reinventing back-end mainframe applications, says Davidson, who, like nearly everyone running ABF's e-commerce site, has an IT background. He began his career as a programmer.

"This is a surprisingly technical company," Davidson asserts, noting that many vice presidents and business managers have college degrees in mathematics, engineering or the information sciences. For example, Michael Newcity, prior to becoming ABF's e-commerce manager, wrote much of the code for the e-commerce site, including a patent-pending application that illustrates shipments via a calendar.

Leaning on his IT know-how, Davidson based the company's e-business strategy on two concepts: One, the Internet would be the ultimate tool for customer self-service and, two, by separating business and presentation logic, core applications could remain on the steadfast mainframe while the front ends vary.

Davidson has experimented with self-service systems — via PC, IVR, fax-back and direct-dial modem applications — since 1983. "We had applications, but they were clunky. It didn't take a genius to see that the Internet gives you the standardized [graphical user interface]," he says.

Maybe not. But in 1996, this realization was so far ahead of the game, a day was looming when he would have to convince top management of his vision.

Many returns

In January 1996, before Fort Smith even had a single Internet point of presence, ABF launched its first site. Customers could now download updated versions of a Windows-based rate application that ABF otherwise

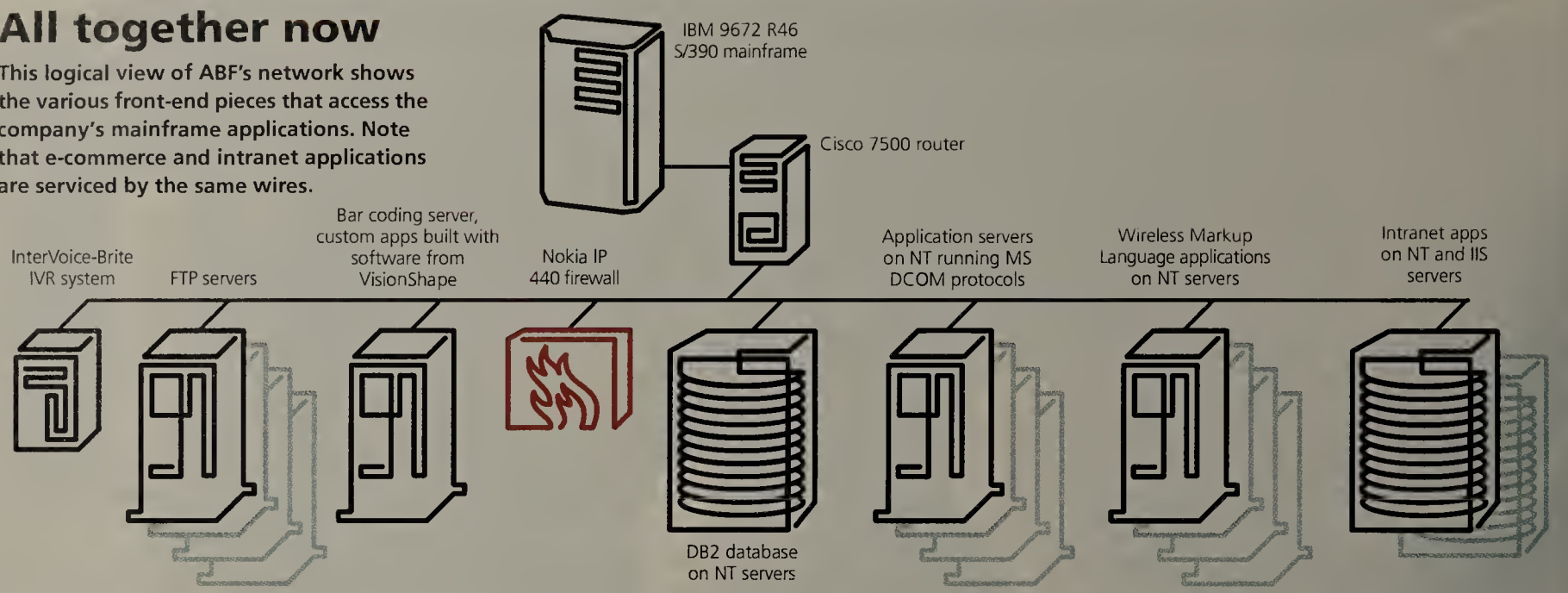
See **Winner,** page 54

ABF Freight System is burning up the e-commerce highway thanks to bold new features on a cost-effective, integrated backbone. Providing the fuel are (from left to right) Bob Davidson, vice president of pricing and marketing for ABF; David Cogswell, director of technical services for Data-Tronics; and Michael Newcity, manager of e-commerce for ABF.

PAM FRANCIS

All together now

This logical view of ABF's network shows the various front-end pieces that access the company's mainframe applications. Note that e-commerce and intranet applications are serviced by the same wires.



Winner

Continued from page 52

would mail to them on disk.

This FTP site cost next to nothing to deploy, but it didn't go far enough, Davidson says. By the summer, ABF was operating a self-service Web site that let customers map routes and trace shipments.

By the end of the next year, a customer could schedule a pickup and create a bill of lading — the formal document required for shipments. By early 1998, ABF customers could generate price quotes that included discounts, view images of shipment documents and review damage claim status, among other functions.

Then, in a move that would define the company's open attitude toward e-commerce, ABF added predictive e-mail alerts. Through these notices, ABF offers progress reports of a shipment in transit and alerts the customer to the probability that the shipment will be late. The data comes from a tool ABF uses internally for the same purpose. This service, Newcity notes, only became available on competitive sites late last year.

ABF executives, who in 1998 were so planted in the old economy mindset that they hadn't even adopted client/server technology, worried that customers would be angered if told a shipment might be late. But Davidson contended that ABF customers would actually benefit from and appreciate being apprised of shipment status. "You have to reconcile yourself to the fact that you are going to tell the customer everything, good or bad," he says.

Davidson would be proved right. In October 1998, predictive e-mail notification went live. At the same time, ABF formally announced the e-commerce site as eCenter, after nearly three years of continuous development. "At that time, the site had already paid for itself four times over in cost savings," Newcity says.

For instance, prior to the e-commerce site, a customer would telephone customer service to trace a shipment, verify delivery or check on damage claims. The representative, in turn, would locate the necessary paper documents and fax them to the customer. As ABF added the tools, customers took on these tasks themselves, in real time and at much lower cost. ECenter cost $985,000 from 1996 through 2000 to build and maintain. Costs for 2000 alone were $425,000, while savings tallied $1.1 million — or $4,140 per workday, Newcity says. This adds up to a sweet return on investment of 139% for last year alone, he says.

As for losing customers over predictive e-mail alerts and other tell-all planning tools, the converse proved true, Newcity says. In a survey Newcity conducted in the third quarter of 2000, 93% of 54 eCenter user respondents said they benefited positively from using online applications. "Shipment visibility" was named by 68% as one of those benefits.

Last year, the eCenter user base nearly tripled, from 8,400 to 23,800 users. Newcity attributes the jump to a concerted effort to get the word out about eCenter. The company's 600 salespeople now train their customers to use eCenter, and the 25 regional vice presidents must visit with a customer every quarter and discuss how eCenter can be improved, says David Stubblefied, ABF CEO.

Better still, rather than tracing shipments all day, call center personnel can engage in proactive, even income-producing, activities, Newcity says. "They can spend time helping customers through complicated logistics issues, like planning the distribution of a multistaged delivery," he says.

Data in the pipe

ABF grew the innovative features of eCenter throughout 2000 by introducing a variety of new functions, including Shipment Planner, Transparent Links, ABF Anywhere and Dynamic Rerouting.

The Shipment Planner displays pending shipments in a calendar format. Transparent Links lets ABF customers incorporate shipping data from ABF's back end into their own systems via XML (see graphic, left). ABF customers typically use this feature to submit pickup requests, via XML parsing and style sheets, when they receive e-commerce orders from their Web sites. ABF Anywhere lets users manage shipment information and communicate with ABF with a Palm VII, Windows CE device or mobile phone equipped with Internet access and a microbrowser.

Dynamic Rerouting lets customers change the destination of an in-transit shipment or recall a shipment. Via the Web site, customers tap into a mainframe application that sends the new destination instructions to the proper ABF service center. ABF then e-mails a confirmation of the new destination and revised charges.

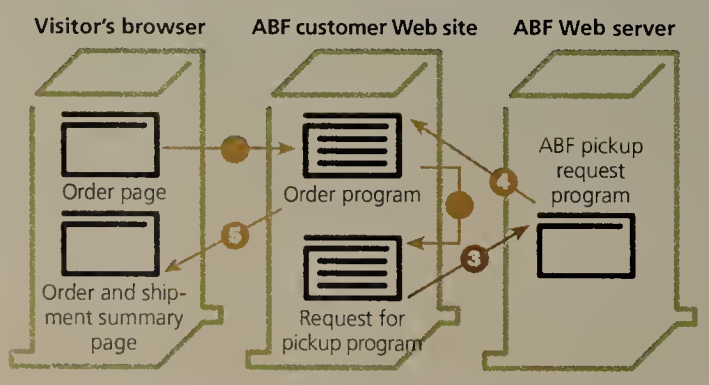
Such applications rely on imaging software accessed via Tivoli Storage Manager, the custom CICS Pipe Web-to-mainframe conversion tool, and a simple but effective frame relay WAN.

Drivers en route check in at ABF service stations in 311 locations until they arrive at the destination terminal, where the shipment is scheduled for delivery to the consignee's address. At each checkpoint, drivers submit documents, such as the bill of lading, for scanning. The images are uploaded via FTP over the WAN to a DB2 database, running on Windows NT, located in

See **Winner,** page 58

Transparent Links

This XML application lets an ABF customer schedule pickup requests made by Web site users, among other functions.



1. A visitor places an order via the Web site of an ABF customer.
2. The customer's order program activates a program that will ask for a shipment.
3. The request for pickup program places an XML call for a pickup request directly to the ABF server.
4. The ABF server sends back a confirmation of the pickup order in XML.
5. The order program sends order and delivery information to the visitor's browser.

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Winner

Continued from page 54

Fort Smith. This creates a visual record; data records are created by scanning a bar code on each document.

ABF manages retrieval requests via Tivoli Storage Manager. Users can view bills of lading, proofs of delivery, packing slips and customs documents, then confirm delivery to their customers.

ABF's internal IT group, which is structured as a sister company named DataTronics Corp. (DTC), handles all hosting, application development and maintenance for eCenter. DTC, the centralized IT department for all four Arkansas Best subsidiaries, is also in Fort Smith.

The routed network

Currently, the ABF network is "one big 10/100," says Dave Cogswell, director of technical services for DTC.

A Cisco 7500 router sits in front of

See **Winner,** page 60

Consumers are only a click away

With e-commerce, ABF created its first consumer business.

By creating a highway to consumers, e-commerce gave ABF Freight System a chance to develop a new line of business: U-Pack Moving.

When moving, people can rent a truck or hire a full-service mover. Consumers who rent must also drive. A cross-country move can be painful, if not dangerous, for inexperienced drivers when road conditions are rough or a truck is poorly maintained. Full-service movers drive, load and unload, and charge big bucks.

With U-Pack, launched in 1997, ABF provides the truck and driver for a cost near the do-it-yourself truck rental rate The customer loads and unloads. ABF quotes prices and factors in discounts via the same rate quotation mainframe application it uses for its freight business. For instance, midweek pickups cost less than weekend jobs.

> "We've always been able to offer this service, but aside from running a Super Bowl ad . . . how do you reach customers?"
>
> **BOB DAVIDSON**
> **VICE PRESIDENT, PRICING AND MARKETING, ABF**

"We've always been able to offer this service, but aside from running a Super Bowl ad and other cost-prohibitive methods, how do you reach customers?" says Bob Davidson, vice president, pricing and marketing for ABF in Fort Smith, Ark.

The answer, of course, is e-commerce. ABF only sells U-Pack over the Web, relying on search engines to drive traffic to the site and word-of-mouth referrals. This low-key, low-cost marketing works, Davidson claims, with customers for U-Pack more than doubling annually. While ABF won't release exact figures, a company spokesman says U-Pack handles thousands of shipments each year.

Likewise, Davidson says consumers can also use the Web to schedule unusual or large shipments, such as a motorcycle sold via eBay.

—Julie Bort

Greetings from the Internet

>> hey,

it's me again ...tomorrow is

it's me again ...tomorrow is not good .
and wednesday is totally out of the question.

. .. . .

how about eventually?

does eventually work
for you?

>>your data

Winner

Continued from page 58

the mainframe, sorting traffic from a series of application servers, today mostly running on NT (see graphic, page 54). These run the IVR system, FTP, custom bar code applications, the NT DB2 application (DB2 also runs on the mainframe), the Wireless Markup Language (WML) server, Tivoli Storage Manager, and a handful of other custom software objects mostly running on Microsoft DCOM. Various NT intranet application servers running Microsoft's Internet Information Server (IIS) 4.0 sit on the same network, Cogswell says.

A Nokia IP 440 service-provider-class firewall, which features Check Point Software's Firewall-1, routing and frame relay functions, links to the NT IIS public e-commerce host.

The CICS Pipe protocol-conversion gateway gets these IP-based front-end applications talking to the applications written in CICS or even COBAL and running on IBM Systems Network Architecture. Using IBM's Advanced Program-to-Program Communications and Common Programming Interface for Communications protocols, the CICS Pipe passes data from an NT application to a CICS transaction, waits for the transaction to process the request, and returns the results, allowing IIS to maintain a session.

With the CICS Pipe, programmers need not deal with the network protocols or even COBAL, says Craig Wahlmeier, senior technical consultant for DTC.

Alternatively, ABF could have used Microsoft's Open Database Connectivity (ODBC), which lets SQL queries pass through to a back-end database. However, ABF found ODBC to be less efficient and secure than the CICS Pipe, which encapsulates queries, Newcity says. "We have experimented with ODBC and have found that it works relatively well for small applications, but the performance degrades significantly when it is used for substantial applications like Shipment Planner."

A downfall of ABF's streamlined infrastructure concerns training. DTC aggressively hires graduates and trains them for six months on the mainframe.

"New people want to do all Microsoft ODBC and do everything on the front end. We have to fight that and tell them to use the Pipe. It's got better security, diagnostic tools, control — if someone's running up the workload, we can stop them," Wahlmeier says.

Farming the future

The next step for ABF is extending its network infrastructure without destroying the simplicity that works so well. The company plans to launch a three-city WAP pilot for drivers handling local deliveries. The WAP applications will let drivers input pickup information immediately, rather than waiting until they reach a service center at day's end, says Richard Bogner, DTC senior technical consultant.

DTC owns a WML server and will rely on the cellular carrier's WAP gateway, says Kevin Taylor, senior technical administrator for DTC.

Building a server farm and implementing load balancing are on tap for early this year, Cogswell adds. These would let ABF distribute Web content among multiple servers, combining failover redundancy with efficiency. ECenter operates on more than 65 servers; at least eight more are expected for the project. ABF also may turn to Web caching, particularly for graphics, if it makes economic sense, he says.

Likewise, Cogswell is considering replacing the expensive and relatively slow-speed frame relay WAN with VPNs and DSL service. While ABF watches its dot-com competitors swinging in the wind over the Internet stock correction, it knows that with its trucks, infrastructure and e-commerce innovation, it's traveling a profitable route. ◪

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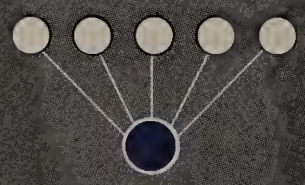

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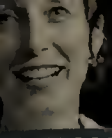


"A lot of times IT people say, 'We can't do that because it's going to be too costly.' OK, then we're developing something that's not driven by the business, it's driven by IT." Lou Russell, Cutter Consortium senior consultant; president, Russell Martin & Associates Consulting Services

Go online to read or listen to the full e-commerce roundtable discussion.

The E-comm ROI squeeze

IT could be shouldering more than its share of e-commerce costs. Here's how to protect your budget. **BY JOANNE CUMMINGS**

WHEN IT COMES TO ANALYZING THE RETURN ON investment for e-commerce initiatives, most organizations either don't do it, or don't do it right.

"In IT, especially when you're on the leading edge, there is an inherent business instinct that you have to have — a gut instinct. And sometimes, ROI just doesn't fit in," says Larry Blazevich, vice president and CIO at Sigma-Aldrich, a St. Louis manufacturer of research and specialty chemicals, and last year's recipient of *Network World's* E-comm Innovator of the Year Award (www.nwfusion.com, DocFinder: 3130).

Sigma-Aldrich did no ROI analysis prior to its foray into e-commerce, and it's not alone. According to a summer 2000 study by research firm IDC, as many as 50% of 650 Internet executives surveyed said they did no ROI analysis on their e-commerce initiatives, compared with just 33% who did and 16% who were unsure.

As more e-commerce initiatives go belly up, however, organizations are starting to pay more attention to the bottom line. Unfortunately, determining e-commerce ROI is not an easy process.

First of all, companies often can't pinpoint how much new revenue a site generates. Did the site earn the sale? Or did it transact a sale that would have occurred anyway, via fax or phone? "We can track Web sales, but did they cannibalize other sales? Probably," Blazevich says.

Traditional accounting rules also stymie e-commerce ROI analysis. IT has historically been classified as a general and administrative (G&A) expense, or generic overhead, as opposed to a cost of sale, explains Tom Mangan, a partner at Arthur Andersen in Atlanta. The cost of sale would include factors such as the salaries of the sales-force and marketing expenses. By subtracting the cost of sale from revenue generated, a company can figure out the profit margin for any product or service.

Prior to e-commerce, this method made sense. But if a company keeps e-commerce costs as part of the IT budget hidden within G&A, the expense of e-commerce won't be reflected in a product's operating margin. That makes products sold over the Web appear artificially more profitable than products sold via traditional channels. "The people in charge of those product lines don't see the cost sitting in G&A," Mangan says. "And they end up with a distorted view of profitability."

Worse still, IT winds up saddled with inflated expenses. "When you look at industry metrics, you see the companies that are moving heavily into e-commerce look as though their IT organizations are performing poorly. That's because their costs are artificially high," Mangan says. "They aren't linked to the sales coming in."

The result is a squeeze on IT. "Executives hammer the CIO to cut costs, while at the same time they like the margins they're seeing on these new electronic sales and want more," Mangan says. "That creates a lot of tension for an IT organization."

Few IT departments can successfully assume the costs of e-commerce projects while also trimming expenses. Something has to change, and that change usually begins with better accountability. It's up to IT to ensure the company properly accounts for the costs — and profits — associated with e-commerce before it decides which projects get the green light.

Some companies, such as Sigma-Aldrich, now have IT play a key role in determining the profitability of new e-commerce initiatives. As CIO, Blazevich sits on a steering committee that ranks the firm's e-business projects by the dollars they would bring in. "If an initiative is definitely going to generate more sales, then that goes to the top of the list," Blazevich says. "No. 2 is hard-dollar cost savings, where we'll actually save money. No. 3 is soft cost savings, such as an improvement in a process or time savings." (See sidebar, page 64.)

Larry Blazevich, vice president and CIO at chemical firm Sigma-Aldrich, believes that ROI should be a primary determinant for every new feature added to an e-commerce site.

JAMES VISSER

Creative financing

Other organizations seek to sidestep such accounting issues by funding e-commerce projects entirely outside the IT budget.

J.L. Hammett Co., an educational materials retailer in Braintree,

Mass., pays for its e-commerce initiatives via sales of advertising and promotions. "From the marketing side, we tell our suppliers that this is new extended exposure for them," says CEO Rick Holden. That exposure would include additional advertising or promotions for the supplier's wares and an opportunity to interact with the supplier's ultimate customers, teachers, "and they pay us for that."

Holden says the company has so far met its goal of keeping the advertising and other payments offsetting or exceeding development costs.

Not only does the site eliminate paper and the costs associated with paper, but it also enables the firm to cut its reliance on temporary help used during the company's busy summer season. "With more of our customers online, we've been able to drop the temporary workforce," Holden says. That change saved the hard costs involved in paying hourly wages, and the soft costs involved in scheduling and training an ever-changing workforce that was often reluctant to learn or even show up for work.

Two infrastructures

But for every J.L Hammett, there's a company that gets blindsided by sales costs. Some diligently weigh IT costs for e-commerce projects against the benefit of a reduced salesforce or the elimination of field sales offices, and the result is an attractive ROI.

Unfortunately, in most cases those salespeople and offices never go away. The company may balk at reducing the salesforce, citing customers who still require hands-on service, or decide field offices are needed for team-building or other reasons. "You're stuck paying double infrastructure costs," Arthur Andersen's Mangan says. "And those costs tend to eat up any benefits associated with the e-commerce initiative."

Other companies perform ROI analysis solely on initial development of a Web site that simply takes orders, while neglecting ongoing costs associated with integrating the site into the business.

These companies "realize the site won't be fully integrated with the back-end systems, order fulfillment and so on, but that is something they plan to do in Phase II," Mangan says. As an interim measure, they hire temporary administrative staff to take the Web orders and enter them into the back-end systems.

But once the costs in G&A start climbing, the IT department can no longer afford to do Phase II. "Now it's stuck because it has this army of administrative people who become permanent employees, and all ROI goes right out the window," Mangan says.

Activities-based costing

Mangan says a good way to ensure the costs of e-commerce don't outweigh the benefits is with a practice known as activities-based cost accounting. Activities-based costing directly assigns all costs associated with an initiative to the cost of the products being sold. Within e-commerce, this means IT costs now buried within G&A are broken down and assigned to the cost of the product sold via the Web on an ongoing basis.

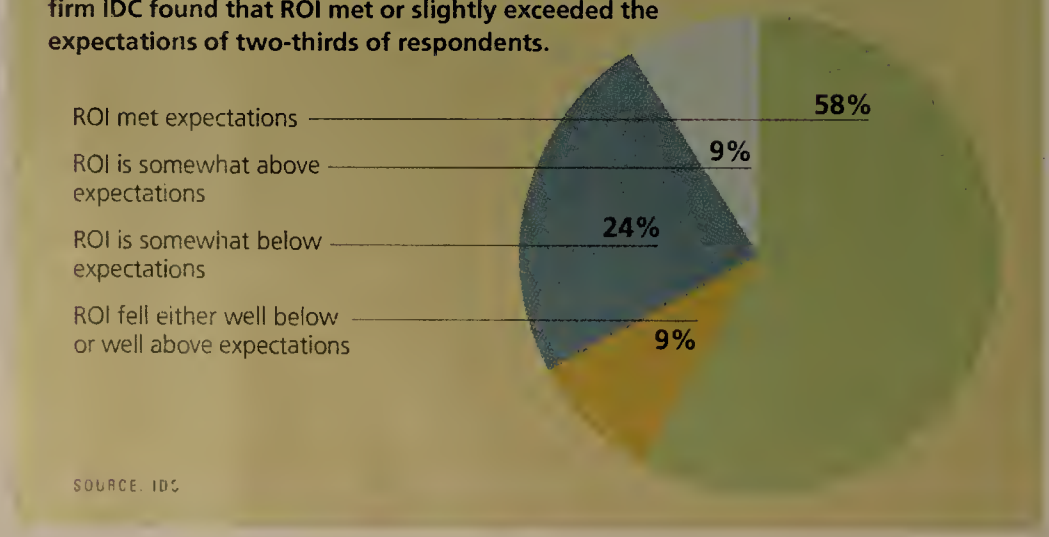
"With activities-based costing, organizations can see the true profitability of e-commerce and make an informed decision about ROI," he says.

But IT people aren't accountants. "They don't need to be," Mangan says. "IT just needs to make sure the organization understands the true financial impact of bringing up this new distribution channel. A lot of companies have made a lot of money by having gut feelings, but you have to understand the impacts of the decisions. In the end, you have to make money at it."

Cummings is a freelance writer in North Andover, Mass. She can be reached at jocummings@mediaone.net.

E-commerce ROI evaluated

In a survey of 650 Internet executives, market research firm IDC found that ROI met or slightly exceeded the expectations of two-thirds of respondents.



SOURCE: IDC

ROI advice from an award winner: Be picky on Web features

ILLUSTRATION BY PHILIP ANDERSON

ROI analysis gets easier once an organization's initial e-commerce site is up. However, it also gets more specific, says Larry Blazevich, vice president and CIO at Sigma-Aldrich, a St. Louis manufacturer of research and specialty chemicals and last year's recipient of *Network World's* E-comm Innovator of the Year Award (www.nwfusion.com, DocFinder: 3130). "First, you need the searching, finding, ordering, shipping and tracking capabilities, just to be competitive. Beyond that, however, each new feature and initiative should be closely monitored in terms of ROI."

For instance, Sigma-Aldrich passed on adding a feature that would have let customers change orders before shipping. Although popular on many e-commerce sites, the feature didn't add enough value to be worth developing and supporting. "Our shipping documents are created about 15 minutes after the order is placed, and that doesn't leave you with a lot of time to change your mind," he says.

Blazevich also says the feature doesn't gel with his market. "When you order chemicals for research, you usually know exactly what you want," he says. "It's not exactly a spontaneous buy."

Not all products should be sold over the Web either, Blazevich advises. Despite some customer requests, Sigma-Aldrich does not sell its chemistry books online because buyers are primarily students placing one-time orders. The time involved in creating and supporting those sales "wouldn't be worth the return. For now, we're concentrating on our repeat customers," he says.

Toward that end, Sigma-Aldrich is integrating its site with marketplace software. "We're spending a lot of time with Ariba, Commerce One and mySAP.com right now, doing the punch out in XML," Blazevich says. "That's certainly far more important and is a higher volume for us than one-time orders. Each organization has to pick and choose what makes sense for its business."

— Joanne Cummings

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How to become a B2B hero

Here's your blueprint for designing and building winning business-to-business extranets.

BY BARRY NANCE, NETWORK WORLD GLOBAL TEST ALLIANCE

OUR BOSS JUST told you that you will be representing your department in the company's new supply-chain e-commerce extranet. You're initially delighted. The project will be interesting, highly visible and great on your resume.

Then, after a moment's reflection, you're less sure. The existing network must remain unaffected. It'll be your job to ensure other development staff don't choose technologies that make this extranet unreliable, slow or expensive.

Oh, and one other thing: You're to tell your boss what kind of pipes you select, their sizes, any hardware you'll need and how that hardware should be configured.

Whew! At the end of this project, you'll either be a hero or a hobo. Because hobos aren't a large segment of *Network World* readers, we came up with ways to conquer the challenges of building a supply-chain network.

We created a mock automotive manufacturer and then simulated two common extranet scenarios for it: a link to a mission-critical vendor, an auto parts supplier, and a link to a less-critical one, an office supply vendor (see "How we did it," page 70). We had three goals: create a reliable network link, both hardware and software; ensure appropriate security; and ensure data integrity.

Network connections

Is a leased-line (T-1 or other data rate), frame relay or Internet-based VPN the best way to conduct transaction-based communications with another company? That depends on how important the link is to your business. Our simulated auto manufacturing facility would lose money by the minute if it couldn't procure its auto parts. Not so for replenishing office supplies.

For the critical link, a pair of leased T-1 lines offered maximum availability. We tried two load-balancing tools, Microsoft Windows Load Balancing Service and Lightspeed Systems Total Control for E-commerce IPMagic, to switch instantly to the second leased line when the first failed. Both performed well.

Using leased lines from two telephone companies let us guarantee 99.9% uptime. At about $1,800 per month for each leased line, plus $18,500 in setup costs, this approach is expensive, but it'll give you the assurance that your supply lines stay open.

We found an equally effective and less-expensive solution: a pair of frame relay links provisioned by different telephone companies. Costs ran $24,500 for setup and $850 per month thereafter (see graphic, page 68). However, we preferred leased-lines because it used simpler hardware and allowed us and our business partner to buy DSU/CSUs from different vendors. Despite the obvious cost savings, we eschewed an Internet-based VPN because it adds administrative complexity, unreliable performance and slightly higher security risks.

Ordering office supplies was a different story. We created a low-bandwidth VPN between our business and the simulated office supply companies. For paper clips, we could weather Internet traffic jams.

Managing the link

Agreeing on service levels and deciding who would be responsible for monitoring the link with the auto parts vendor were important steps in our project. To maintain 99.9% reliability, we devoted each T-1 link (1.544M bit/sec) to auto parts requisition transactions, with no e-mail or voice over IP on the wire. Because it's reliable and easy to configure, we chose Lucent VitalSuite to monitor the WAN (see Figure 1, page 68).

Negotiating with a business partner to use TCP/IP should be easy. It's pervasively popular and eminently routable. Nonetheless, we didn't want our lab experience to be too smooth. We stipulated that our auto parts vendor used an AS/400 and IBM's SNA.

For our initial approach, we concluded the best solution to the disparate transport layer problem was to design our application with IBM's Advanced Program-to-Program Communications (APPC, also known as LU 6.2) to send and receive transactions. Despite our best efforts to complicate matters, the design and administration of the APPC link turned out to be child's play.

The only real difficulty was designing the automated dialog to be fault-tolerant of sudden connection outages, so we could guarantee orders would get to their destinations. Our solution was to consider each transactional group of messages as an atom, meaning the application processed only complete transactions. Configuring a pair of Cisco 4700 routers, one at our auto assembly plant and another at the auto parts vendor's site, to convey the SNA packets across the WAN link, was also painless.

We rejected the idea of using a relational database as an interface between the auto manufacturing plant and the parts vendor. Although inserting orders and confirmations in a shared database would be easy, each partner would need to send a trigger over the WAN to alert the other of a newly inserted order or confirmation. Why not send the entire transaction instead of just the trigger?

In another database-oriented

Supply-chain extranet costs

Here's a breakdown of estimated costs for our two extranet links.

Auto parts extranet

Component	Initial cost	Ongoing monthly cost
Each T-1 WAN link	$18,500	$1,800
Local infrastructure, including servers, operating systems, cabling, switch ports	$68,000	$2,500[2]
Homegrown SNA LU 6.2 software, including IBM SNA library	$450,000[1]	$150,000[3]
Microsoft messaging tools	$419,000[1]	$135,000[3]
IBM messaging tools and MQSecure	$400,000[1]	$135,000[3]
Total	**$1,355,500**	**$424,300**

Office supply extranet

Component	Initial cost	Ongoing monthly cost
Each VPN link (two firewall boxes, frame relay links)	$8,000	$1,000
Local infrastructure, including servers, operating systems, cabling, switch ports	$22,000	$500
Oracle and BEA WebLogic software	$90,000[1]	$15,000[2]
Total	**$120,000**	**$16,500**

Individual product prices

Product	Price
IBM MQSeries	$3,000 per server processor plus $300 per Windows client
IBM Communications Manager/2	$995
Microsoft Windows NT Server 4.0 Enterprise Edition (includes Windows Load Balancing Service, Message Queue Server and Transaction Server)	Starts at $3,999
Microsoft SQL Server	Starts at $1,399
Microsoft SNA Server (includes COM Transaction Integrator for CICS)	Starts at $1,359
Candle MQSecure	Starts at $800 per node
Lightspeed Systems Total Control for E-commerce IPMagic	Starts at $7,995
Lucent VitalSuite	$44,000 for unlimited servers

[1] Includes software license fees and salary of in-house programmer.
[2] Includes salaries of part-time administrators.
[3] Includes salary of maintenance programmer.

approach, partners would poll the database periodically for new, unprocessed activity. But polling wastes a lot of bandwidth. We also rejected the idea of database replication because both business partners needed updated data and we couldn't designate a single database owner as responsible for this.

The homegrown SNA link to the AS/400 worked well, but we wanted to investigate a method that would limit our application programmers' involvement in making network connections. After all, they're not network experts. We chose to contrast our homegrown SNA solution with Microsoft's and IBM's messaging middleware tools, and found the messaging tools to be a better approach. The middleware assumed most of the network delivery work and required less programming.

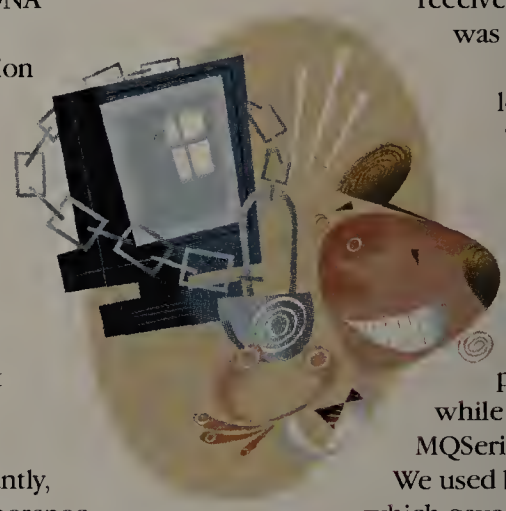
In separate tests, we replaced our homegrown SNA link with Microsoft's Message Queue Server (MSMQ) and IBM's MQSeries (see Figure 2, page 70).

These tools guarantee message delivery, which make them appropriate for transaction-based automated dialogs, and they convert between data formats as necessary. Although both performed well and were reliable in the lab, we found IBM's MQSeries gave us the best overall network link between our Windows NT servers and the business partner's AS/400.

MQSeries was simpler to set up than MSMQ and required virtually no ongoing administration. With a version that runs on nearly every operating system, it was also more platform-neutral than the NT-specific MSMQ.

Conversely, using MSMQ, which Microsoft bundles with Windows NT Server 4.0 Enterprise Edition and Windows 2000 Server at no extra charge, was complicated by the need to install and configure three other components — Microsoft Transaction Server, SNA Server and SQL Server. MSMQ stores queue information (but not the messages themselves, which reside in memory-mapped files) in SQL Server. We chose to use another optional component, Microsoft's COM Transaction Integrator (COMTI) for CICS, to provide transactional access to the auto parts vendor's AS/400 computer. COMTI consists of a set of development tools and run-time services that treat SNA transaction and business logic as COM components that run in a Windows DNA environment.

We used Transaction Server to ensure transactional integrity and manage a pool of database connections. SNA Server established and maintained the link to the AS/400 computer. The result required a considerable programming effort. More importantly, from a networking perspective, we found that MSMQ, Transaction Server, SNA Server and SQL Server burdened us with additional administrative chores necessary for maintaining three applications. However, they performed quickly, and were robust and reliable in the configuration we created.



Security

Lack of security was IBM's MQSeries' major disadvantage. We needed to ensure that data flowing through the link was encrypted, the transactions were authenticated as originating from approved sources and data integrity was verified. A third-party product, Candle's MQSecure, gave us these attributes for MQSeries, whereas we relied on built-in security features and NT's access control lists (ACL) for MSMQ (see story on middleware security, www.nwfusion.com, DocFinder: 3124).

Using RSA's RC2 technology to encrypt our messages, MQSecure-protected MQSeries messages were encrypted from the sending application to the target application. Messages were completely unintelligible with Sniffer and, because MQSecure encrypts the user ID portion of each message, spoofing a bogus message (inserting a fake message onto the wire) appeared impossible. MQSecure's authentication of the message's source also ensured nonrepudiation. Validation of the received message ensured it was unaltered.

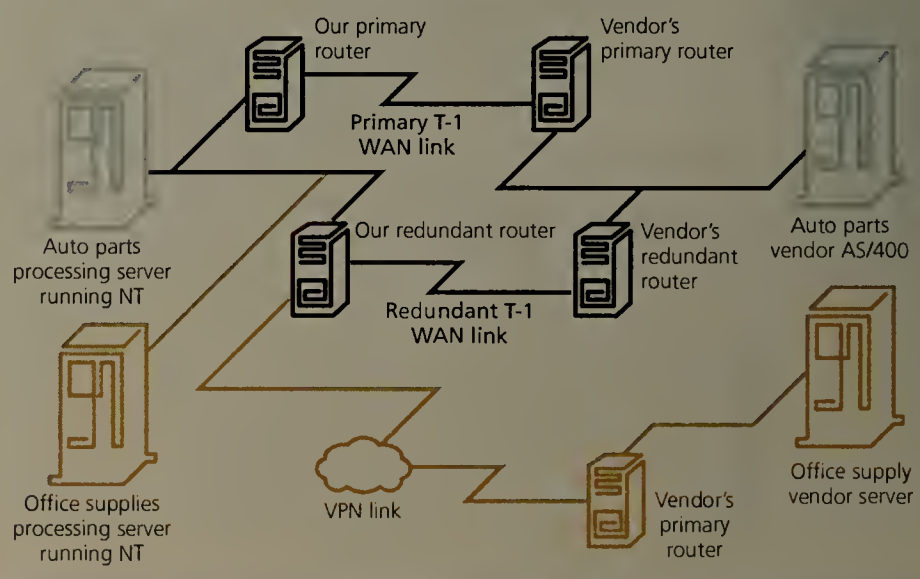
MQSecure offers two levels of security, "channel" and "application." Channel security protected data only during its travels across the network. Application security additionally protected the data while it resided in the MQSeries message queues. We used both levels in the lab, which gave us end-to-end security for our transactions.

For Microsoft's MSMQ, we relied on the product's built-in security features and NT ACLs. The product gave us good security, producing over-the-wire messages that were unreadable on Sniffer's display and message queues that were

See **Extranet,** page 70

Figure 1: A view of two extranets

Here's the schematic of our extranets using our custom programming.



Continued from page 68

inaccessible until we entered an authorized NT Server logon ID and password.

On an NT Server machine, we used Windows Explorer to set up ACLs for our message queues. For files and directories, MSMQ created at installation time, these permission keys kept unknown users from reading or sending messages to a queue, and they additionally kept unprivileged users from sending messages to a queue. Anyone authorized to administer rights and permissions on NT Server can administer MSMQ. We used MSMQ's Explorer interface to create message queues, assign priorities and monitor the delivery of messages. We also configured MSMQ to log events, such as rejecting a password or opening a queue, in the NT Server Security Log.

MSMQ used the Microsoft Crypto API to encrypt and digitally sign the messages in the queues. Like MQSecure's RSA-based encryption, the Crypto API preserved the confidentiality of message queue entries, while the digital signatures prevented the spoofing of counterfeit messages. Selecting encryption and digital signing features was a matter of clicking checkboxes on property sheets displayed by the MSMQ Explorer.

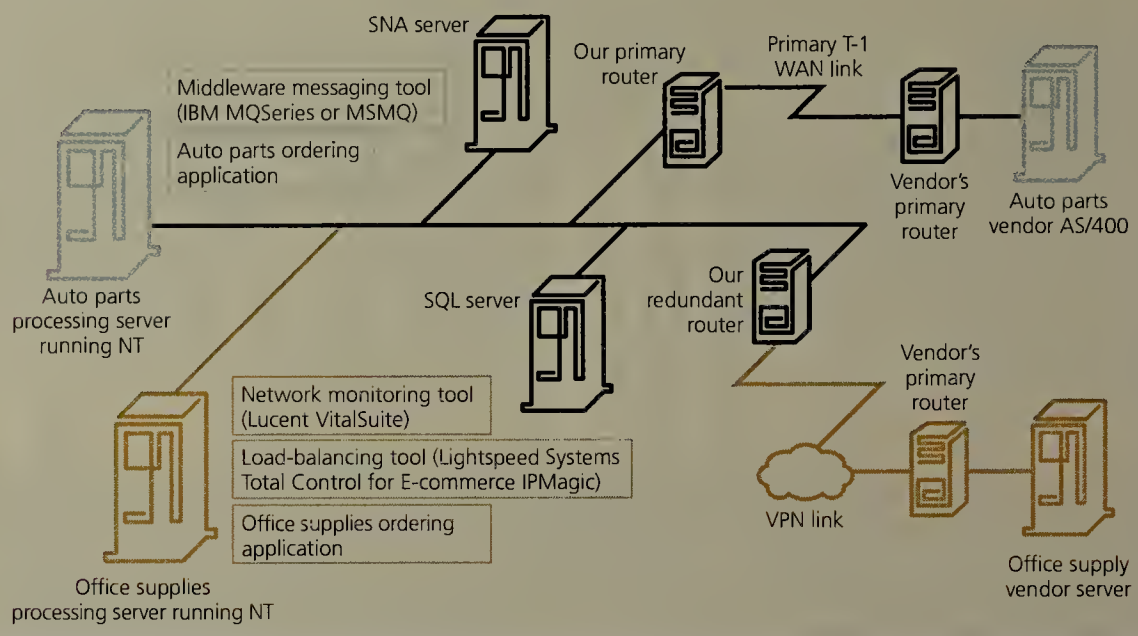
MSMQ also offers what Microsoft calls Independent Clients — a separate, unencrypted messaging facility that relies on local queues instead of network communication. Avoid this feature if security is a consideration.

Before we began encrypting our business-to-business network link with MSMQ or MQSecure, we discovered via the Sniffer that the format of the network messages could make understanding their contents slightly more difficult. The binary, proprietary transaction dialogs we designed had the side benefit of being more secure than our XML-based automated conversations. To decode a binary message, a hacker would have to analyze which bytes of a network message belonged to which data fields. In contrast, our XML-based dialogues looked like plain English in the Sniffer displays. Thank goodness for middleware security.

As for the office supply extranet, we decided it didn't need any additional security beyond that inherent in each VPN. We used Cisco Secure PIX 506 Firewall devices to create VPN links to our simulated office supply vendors. The Cisco units' HMAC SHA1 algorithms provided more than adequate authentication and encryption services for the network tunnels through which we requisitioned our paper clips. The units also acted as firewalls between us and the Internet.

Figure 2: Middleware to the rescue

For our sample extranets described in the accompanying article, we replaced custom programming with middleware and gained more control over data streams.



Avoiding problems

During network design of our auto supply link, we attempted to identify all points where the network could fail and then planned redundancy. With a total of eight routers and DSU/CSUs, four at each site, we built redundant network data paths. We used a standby pair of routers and DSU/CSUs for each of the two parallel T-1 WAN links to our auto parts vendor. The fallback mechanism for the interfaces to the office supply vendor consisted of having VitalSuite monitor VPN and T-1 links and page us when a link failed.

As we created and tested our extranet links, we also put VitalSuite to work looking for application performance problems and providing utilization data for capacity planning purposes. VitalSuite's reports and graphs let us keep a vigilant eye on critical factors such as bandwidth usage and server CPU utilization. It worked equally well in this capacity for the auto supplier links and the office supply VPN.

When the links we've described here go into production, we're confident our bosses will declare our entire team to be heroes. Eating beans by the railroad tracks won't be in our future.

Nance is the author of "Introduction to Networking," 4th Edition and "Client/Server LAN Programming." Nance is also a member of the Network World Global Test Alliance. He can be contacted at barryn@erols.com.

For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.

How we did it

Using Visual Basic and Oracle Version 8i relational database, and a combination of Active Server Pages, BEA Systems' WebLogic 5.0 application server and Java 1.1.7B code, we developed the client and server sides of two business-to-business order-fulfillment environments. As the need arose, we used additional development tools, such as Visual C++.

The network software tools we used to support our applications were IBM MQSeries and Advanced Program-to-Program Communications; Candle MQSecure; Microsoft Windows Load Balancing Service, Transaction Server, SNA Server, SQL Server, Message Queue Server and COM Transaction Integrator for CICS; Lightspeed Systems Total Control for E-commerce IPMagic; and Lucent VitalSuite (see graphic, page 68).

Our first scenario simulated software-managed, on-demand purchase of office supplies. The office supply vendors were Windows- and Intel-based, like us. Our inventory database contained over 100 items, and we set up multiple suppliers for each item.

For the automotive supplier, our plan specified that the auto parts vendor use an AS/400 computer running OS/400, but we used Communications Manager/2 (CM/2), running on OS/2 Warp, to act as the AS/400 side of our SNA LU 6.2 sessions in the lab. You couldn't tell by looking at the SNA messages on the wire the kind of computer they'd come from.

Our server components ran on NT Server 4.0 (Service Pack 5), using three Gateway 2000 NS-8000 computers with 333-MHz Pentium II dual processors, 512M bytes of RAM and three 9G-byte SCSI RAID-5 drives. Client software ran on a mixture of 30 NT Workstation 4.0, Windows 2000 Professional, Windows 98, OS/2 Warp 4.0 and Macintosh System 8 platforms. Three 100M bit/sec Fast Ethernet local networks, linked by leased lines, frame relay and VPNs, connected our servers and clients. Each WAN link used Cisco 4700 routers and VeriLink WANsuite 5160 DSU/CSUs.

In each extranet environment, we set up a business-to-business order-fulfillment environment and sent and received order, delivery and invoice transactions. Each office supply vendor responded to our request messages with confirmation messages and, periodically, invoice messages.

The second and much more critical environment procured auto parts from a primary vendor, on demand, for a simulated auto manufacturing plant. In automated form, it let us order parts, schedule deliveries, see how many of each part were in stock, trigger the manufacturing of new parts when stocks ran low and receive the vendor's invoices. We experimented with proprietary dialogs we designed ourselves and XML-based dialogs. We considered how well each product let us customize our automated business relationships to accommodate unique business requirements for bidding, ordering and delivery needs.

We examined the network traffic each product and approach caused, using Network Associates Sniffer software to discover packet sizes, traffic densities, network utilization and time intervals between requests and responses.

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WILL WALDERON/MPG

In pursuit of validation

An emerging standard offers real-time certificate validation, necessary for any high-stakes e-comm site. **BY IAN POYNTER**

IMAGINE THE FOLLOWING SCENARIO: You're operating an online service that trades currency futures. You've built a public-key infrastructure for distributing certificates to traders for authentication. When traders access your secure Web site, their browsers present the certificates you've issued and, based on this information, your site lets them place orders. Because your system supports transactions worth millions of dollars (and other currencies), you've made the certificates valid for six months, rather than the more common one year.

Now suppose one of your client companies dismisses a rogue trader whose certificate is valid for another three months. How can you ensure that the trader's access is immediately terminated? The answer is by using a procedure known as certificate revocation.

When a certificate is revoked, it is declared invalid before it has expired. The primary mechanism for this is the Certificate Revocation List (CRL), a digitally signed, time-stamped blacklist of revoked certificates that haven't expired. The certificate authority, which is the agency that originated the certificate, issues the CRL periodically. But CRLs have some major flaws. For one, they don't operate in real time. Many commercial certificate authorities issue CRLs only once per day at the most. This would certainly not be acceptable in our currency trading example.

Also, simply placing a certificate on the CRL isn't enough. The application requiring authentication must check the CRL each time a certificate is submitted. This is problematic for many reasons. First, a CRL quickly becomes unwieldy. Each certificate authority keeps only one CRL for each root certificate, which is a top-level certificate under which many individual certificates are issued. And the CRL is cumulative — every revoked certificate is added to the CRL and kept there until it expires.

So the CRL grows immense. For instance, CRLs for some root certificates issued by VeriSign, a major commercial certificate authority in Mountain View, Calif., can be a megabyte in size. (VeriSign's CRL index is available at http://crl.verisign.com.) If a certificate authority uses a single root certificate for each individual certificate it issues, as can be the case when a corporation is its own certificate authority, then all revoked certificates would be listed in one CRL.

Hence, compiling, signing, transmitting, publishing and processing a CRL is a time-consuming process that eats CPU power. In the worst case, this can take seconds to complete. The time constraint and resource drain grow exponentially when a Web site must check certificates against multiple certificate authorities, as can happen after a merger when companies use different PKIs.

Another failing is that when a certificate authority updates its CRL, it overwrites the previous file, keeping no historical data.

But a mechanism that lets an application quickly verify a certificate's validity in real time is now available: the Online Certificate Status Protocol (OCSP). Standardized by the Internet Engineering Task Force in June 1999, OCSP became available in select PKI and independent validation products shortly afterward. However, because companies have only recently come to grips with PKIs, first adopters are only now beginning to implement it.

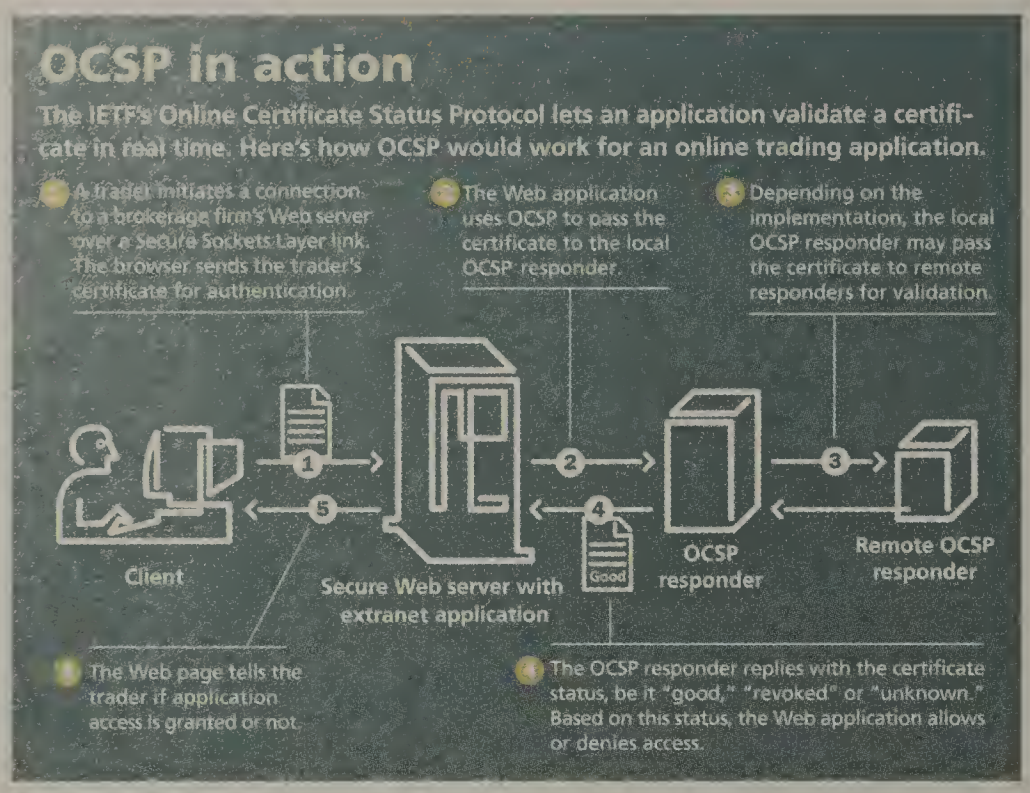
"Revocation has been the 5,000-pound elephant in the living room that everyone has been trying to ignore," says Jim Hewitt, director of consulting and technical services for CertCo, maker of OCSP validation software. "If you are relying on CRLs, you are only as good as your last CRL."

ALEX WILLIAMSON

Real-time validation

Early users say they can't live without OCSP. Take, for example, TC TrustCenter, a certificate authority in Hamburg, Germany, which services banks and other organizations in the European Union. While the company developed its PKI in-house, it purchased validation tools from KyberPass, in Ottawa.

OCSP adds the real-time status checking that TC TrustCenter's customers are beginning to demand, says Lutz Behnke, product manager for TC TrustCenter. "I think that validation should, must and will come over the next six to nine months, because people will realize that certificates



are valid for too long a period. There must be a move to real-time status checks," he says.

Real-time validation via OCSP helps TC TrustCenter's clients immediately terminate online financial services to customers who haven't paid their bills. "Status checks are definitely required if you want to have any chance of stopping customers using a service without paying," Behnke says.

In an OCSP-based system, when a certificate needs validation, the application passes a request to an OCSP responder, such as KyberPass' Validation TrustPlatform or ValiCert's Validation Authority. The responder verifies the certificate, informing the client whether the certificate has been revoked. The responder can be a simple repository for the latest CRLs, but it adds more value when it allows revocation of certificates in real-time from an administrative interface.

The responder sits on the corporate network and answers queries from applications that need to check the validity of certificates. On the back end, the responder may contact a remote responder at the certificate authority's premises, although this isn't a necessity (see graphic, above). Responders are sold as part of PKI products or as independent packages.

OCSP lets the power of PKI be available to all applications, especially those that have high-value, high-stake transactions. "As OCSP becomes more prevalent, revocation is something that all PKI-based applications can consider, without the need to process CRLs," CertCo's Hewitt says.

One area with an obvious, immediate need is online trading, he adds, where "the only assurance of each others' identities are various pieces of digital information, including certificates. Validation allows people to trust credentials they are presented with," Hewitt says.

Good for all

Clearly, online status checking should be part of any application that relies on certificates for authentication and authorization, and part of every certificate-based architecture. "As OCSP has become available in applications, customers have realized that online status checking is something they should be doing," Behnke says.

When considering certificate-based authentication and authorization, IT should make sure online status checking is available in the products being evaluated. Right now, that basically means looking for OCSP Version 1 support (see sidebar, this page).

Real-time certificate validation is an enabler for business-to-business and business-to-consumer e-commerce because it lets participants in any transaction be sure they're dealing with up-to-the-minute information on the validity of the certificates being used. Validation in general and OCSP in particular are definitely here to stay.

Poynter is founder and president of Jerboa, Inc., an Internet security consultancy based in Cambridge, Mass. He can be reached at ian@jerboa.com.

ALEX WILLIAMSON

To extend OCSP or not?

Some experts favor extending the Online Certificate Status Protocol while others prefer another protocol.

The Internet Engineering Task Force defines Online Certificate Status Protocol Version 1 in RFC 2560 and is currently working on Version 2. This new version will add the ability to request information on the status of a certificate at some point in the past, a feature Certificate Revocation Lists and the current standard do not support.

The new version also addresses the validation of attribute certificates. These allow the separation of authentication information, stored in a certificate used to gain access, and authorization information, stored in a separate certificate that identifies specific services that can be accessed. And it provides clarifications of some parts of OCSP Version 1.

It's not clear that OCSP Version 2 will add immediately necessary features to OCSP Version 1, which is now supported by most major public-key infrastructure vendors.

Some industry watchers even say extending OCSP, as proposed in Version 2, will make a simple protocol unnecessarily complicated. RFC 2560's primary editor, Ambarish Malpani, favors an alternative — the Simple Certificate Validation Protocol (SCVP) — as a way to add features, rather than extending OCSP in ways that might slow its deployment. "We can either continue with OCSP in the standards processes with the IETF, although some clarification is necessary, or we can specify a new protocol [when more features are required]. OCSP is a very targeted protocol, which is part of its strength for interoperability and standardization," explains Malpani, who is co-founder and chief architect at ValiCert, a certificate validation vendor in Mountain View, Calif. SCVP extends validation to include attributes, as is proposed in OCSP Version 2. But it goes beyond answering the simple question "is this certificate valid?" to the more complex "is this certificate valid for this particular purpose?"

It also simplifies the tasks the client must perform to validate a certificate, moving the potentially complex process of building such certificate chains to the server. This makes client software more lightweight and better, for example, for wireless devices, but also makes server software more complex. SCVP is still in the IETF draft process.

While it's not clear whether vendors will support OCSP Version 2 and SCVP, or whether a merged "superset" standard will appear, it's certain OCSP Version 1 is here to stay. It provides a simple mechanism for allowing certificate status checking and validation to be built into many applications, which can only facilitate the deployment of PKI-based solutions.

— Ian Poynter

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The m-commerce fallacy

Mobile commerce may become a critical sales channel for your company, but before barreling in, consider its current drawbacks. **BY BETH SCHULTZ**

AVE WIRELESS INTERNET DEVICE, will buy.

That's the motto of the madly growing mobile-commerce industry. A slew of outsourcers, software makers and infrastructure vendors have sprung to life, convinced that anyone who has a cell phone, two-way pager or PDA is hankering to use it to buy stuff over the Internet. It doesn't matter that early users indicate they'd rather drive 20 miles in a blinding snowstorm than navigate through a transaction via a wireless device.

Clumsy user interfaces, cumbersome applications, low speeds, flaky connections and expensive services have soured many who have tried m-commerce, as found in a usability study conducted last fall in London by the Nielsen Norman Group. In the study, the consultancy gave 20 users cell phones that support the Wireless Application Protocol (WAP), a set of protocols designed to make Web content skinny enough to fit on cell phones and other small wireless devices. WAP was developed by the WAP Forum, an industry association in Mountain View, Calif.

The research firm had participants use the phones for one week and record their impressions. At the study's end, 70% of the participants said they would definitely not want to use a WAP phone again within one year. "WAP usability is horrible," says Jakob Nielsen, co-founder and principal of the Fremont, Calif., firm.

Privacy and security concerns also dampen enthusiasm for m-commerce.

When it comes to privacy, location-aware applications, which use knowledge of a user's exact location, bother people most. Support for location-based services are often included with a hosting service or m-commerce infrastructure product. If not, it'll likely be available as an option. A commonly described scenario for location awareness is of a retailer zapping an ad to someone walking by a brick-and-mortar outlet. While some shoppers may be ecstatic to learn about a sweater sale 10 feet away, others would surely find this a creepy invasion of privacy.

Security concerns center on how to protect transactions as they pass from the wireless net, across the m-commerce infrastructure and into corporate back-end systems. The need for WAP and Palm translation gateways, typically housed within the carrier network, is the problem. As the gateway translates data from the wired to wireless format, a moment exists when that data is unencrypted (see www.nwfusion.com, DocFinder: 3129). For a financial services application or other situation requiring ironclad security, those gateways should reside behind your firewall, says Mitch Bishop, vice president of marketing at e-commerce software infrastructure vendor Mobileum in Pleasanton, Calif. But at this point, he notes, most IT shops are comfortable keeping those gateways on the carrier premises.

The other security concern is that the devices are so darn easy to lose and steal. A valid user ID and password could let the thief make purchases; server-resident extended user profiles often store credit card and other necessary validation information to avoid cumbersome data entry with the wireless device.

M-commerce doesn't yet factor in support for security mechanisms such as digital certificates, although work has begun. For example, Entrust Technologies subsidiary Entrust.net is launching a trial WAP certificate service for developers and service providers building wireless Web applications.

MICHAEL VENTURA

P.K. Kannan, associate director for the University of Maryland's Center for E-Service, likes his wireless freedom, but sees limited use for m-commerce right now.

Where the hype ends

Taking these concerns into account, it looks like good old e-commerce, the traditional way via a stationary PC and a dedicated Internet link, will serve many consumers' purposes for years. "Most consumers have little incentive to switch from e-commerce to m-commerce," says P.K. Kannan, associate director for the University of Maryland's Center for E-Service in College Park.

But even such unavoidable obstacles have done little to stall m-commerce maneuvering. Just days into 2001, for example, two wireless leaders — Sprint PCS on the service side and Palm on the device end — struck a deal through which Palm users will be able to access information on Sprint's wireless network. A cobranded version of the My-Palm portal will include Palm wireless personal information management services, e-mail access, entertainment listings and m-commerce.

Vendors such as these are banking on statistics that paint a fantastic picture of a wireless world. Market research firm IDC predicts the number of m-commerce subscribers will grow from 399,000 in 2000 to 29 million by 2004. In the same time frame, IDC says, users will conduct $21 billion worth of m-com-

JERRY KALYNIUK/MPG

"You can't outsource project management."
Lou Russell, Cutter Consortium senior consultant; president, Russell Martin & Associates Consulting Services

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merce transactions.

The argument is that m-commerce is a natural byproduct of owning a wireless device. An AOL spokeswoman puts it this way: Of the company's 26 million subscribers, "Sixty-seven percent own a cell phone; 23% own a pager; 72% own a cell phone or a pager. We're really excited about the possibilities."

Of course, the logic is faulty. Just because someone owns a TV doesn't mean he patronizes a shopping channel. Just because someone owns an Internet-capable wireless device doesn't mean the person will ever shop with it.

Equally important is that the development effort required to conduct consumer-oriented m-commerce transactions is gargantuan.

You'll need to support myriad content formats, devices and mobile wireless networks. Some customers might be using WAP-enabled phones, while others use the i-Mode service popularized by NTT DoCoMo in Japan. Some devices devote much of their real estate to the screen; others can barely display three lines of text.

So nobody knows for sure whether m-commerce will grow as hardy as its e-commerce antecedent or will wither on the vine like the now-infamous push technology. Even the staunchest believers admit the talk far outpaces the reality. "I expect astounding things coming in the future, but we need a reset on the market projections and hype of today," says Peter O'Kelly, senior analyst with market research firm Patricia Seybold Group.

Another channel

Nevertheless, nearly everyone agrees that m-commerce will materialize in some form. At its very least, it will become another must-have sales channel for the modern corporation.

The question for IT executives is how to proceed.

Most analysts say you need to begin researching m-commerce technology with the goal of wireless-enabling at least a portion of your site within the next two to three years.

Kannan, who is also an associate professor of marketing with the University of Maryland's business school, says m-commerce will only become essential for companies whose products or services are time-constrained. He and others say these companies should have m-commerce initiatives in place. They include financial firms offering online trading, payment and portfolio management services, and travel (airline, hotel, rental car) and entertainment firms offering online booking.

Impulse sales have a moderate chance of success with m-commerce. Companies with

See **M-commerce**, page 80

DAVID POWERS

Adam Dubov, vice president of content and product management for consumer dining portal Food.com, plans on digging into m-commerce with a hosted application due out this spring.

When m-commerce rules

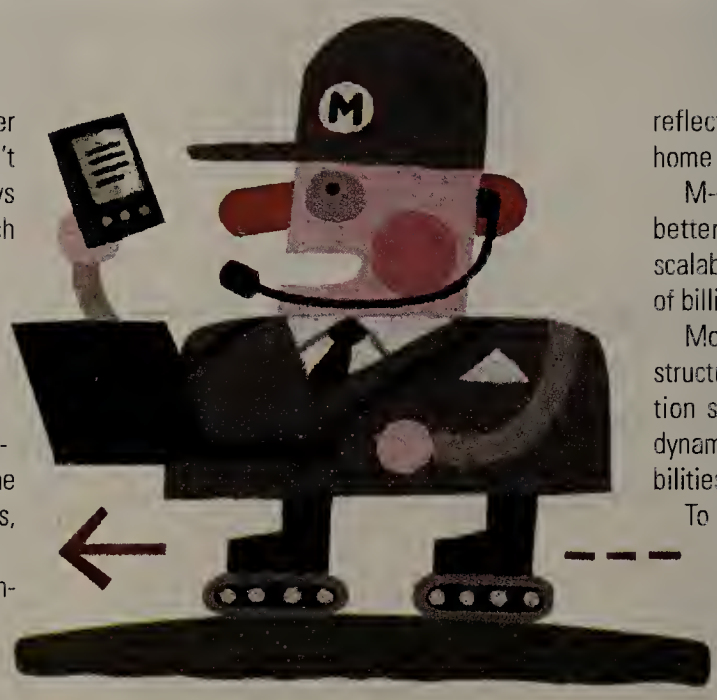
Visitors may be accessing your sites as often from their wireless devices as from their PCs.

When and if wireless Internet access ever surpasses wired connectivity, "you don't want to just be bolting on wireless," says Peter O'Kelly, senior analyst with market research firm Patricia Seybold Group.

This means you shouldn't be taking an e-commerce site and converting it via transcoding, a Web-to-wireless translation process (www.nwfusion.com, DocFinder: 3126). It's just too labor-intensive to rely on indefinitely. Each time your Web content changes, you've got to convert that HTML into the mark-up language used by wireless Internet devices, and today's devices use several mark-up languages.

M-commerce platforms that let you develop content specifically for wireless devices — not just retag Web site content — have just begun to ship. They include Total-e-Mobile from Bluestone Software; SiteMorfer from NetMorf; and Mobileum from Mobileum. These platforms sit between the wireless net and back-end corporate systems.

Take the Mobileum platform, which features five components. The first is developer tools, one for mapping out a wireless application and the other for generating style sheets. Second are presentation services, for translating XML input into languages and styles of wireless devices. Third are core application services, including security, registration and gateway interfaces. Next are optional enhanced wireless service modules. They provide features such as cookie management, which lets device users specify personalization and security; and application session management, which saves users from having to start transactions over from scratch if they lose their wireless connections, says Mitch Bishop, vice president of marketing at Mobileum. Last are application integration services, for connectivity at the back and front ends with wired-world applications.



JOCHEN GERNER

With the help of such a platform, wireless becomes just another integrated channel for reaching customers. A user who initiates a stock trade from his Palm during his commute will see that transaction reflected when he logs on later that day from his home PC or checks his account status over the phone.

M-commerce infrastructure platforms also scale better than transcoding-based products, and that scalability will be much needed if market projections of billions of users materialize.

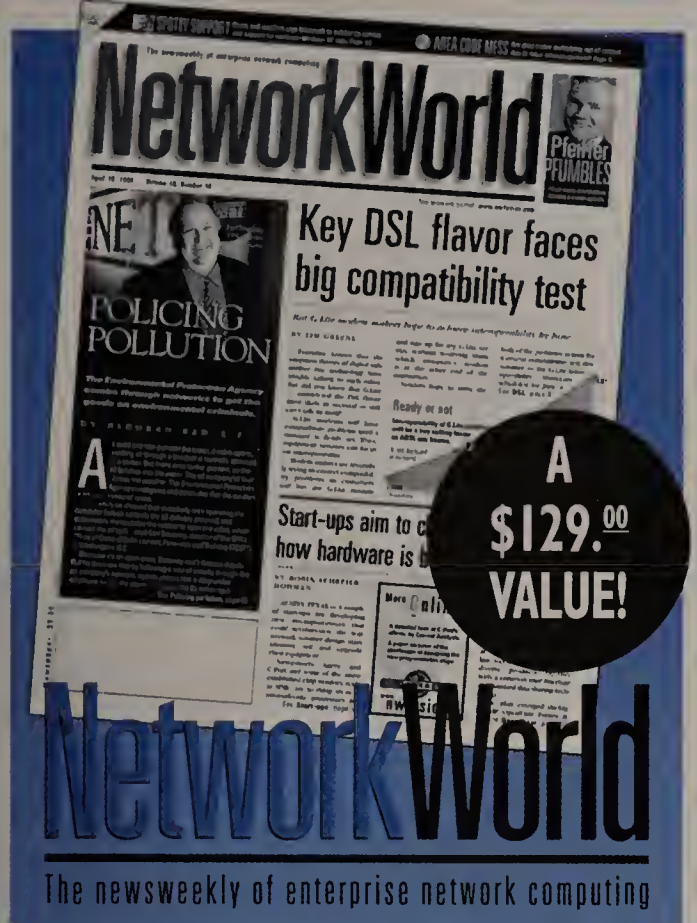
Mobileum built its m-commerce software infrastructure on top of BEA Systems' WebLogic application server for scalability. For robustness, it uses dynamic load balancing, clustering and failover capabilities, Bishop says.

To aid developers, Bluestone's Total-e-Mobile comes with loads of templates, a set of four reference applications, and a Wireless Application Protocol gateway and emulators so developers can test applications, says Tony Wasserman, vice president of Bluestone's West Coast Labs.

Swisscom, the principal provider of telecommunications services in Switzerland, is building an m-commerce portal for consumers using Bluestone's framework.

The portal will let customers find and personalize services for their mobile devices, says Christoph Maier, technical project manager with Swisscom. Eight Bluestone developers are working on-site, readying the m-commerce portal for its midyear launch, he says.

— Beth Schultz



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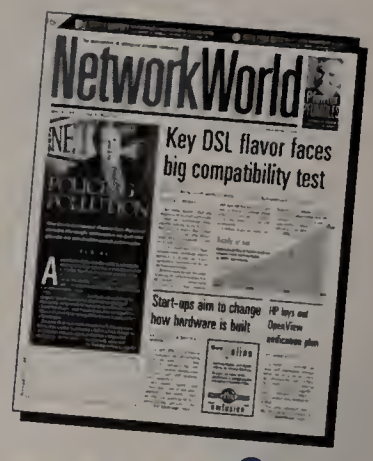

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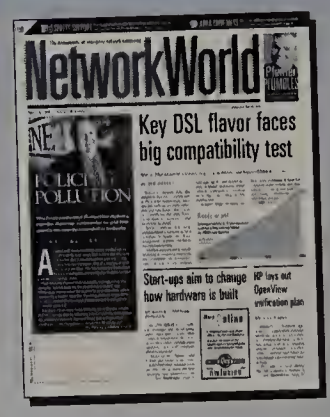

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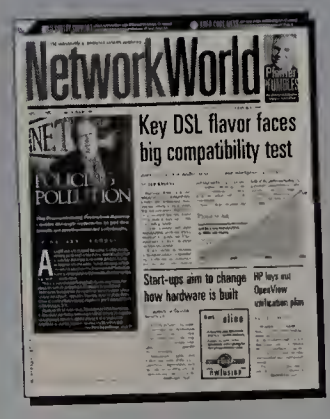

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M-commerce
Continued from page 78

strong brand names selling inexpensive products such as CDs, books, flowers and food can capitalize on location-aware applications.

However, "only companies with the technological capabilities and having good experiences and reputations on the Internet can do this as a viable strategy," Kannan says.

In contrast, companies that sell expensive products with involved purchase decisions are not likely candidates for m-commerce. "Companies can use wireless to advertise and list products and store locations, but the chances that sales will be made through wireless orders is rather slim," Kannan says. He advises these companies to create a wireless channel by enlisting in wireless portals that help shoppers compare prices and identify closest store locations for purchasing.

Although the success of m-commerce is very much up in the air, the argument most experts use for experimenting with it now is to be ready if the onslaught does hit. Seven years into the commercialized Internet, most companies still aren't in tune enough with Web processes to integrate them effectively with the existing infrastructure.

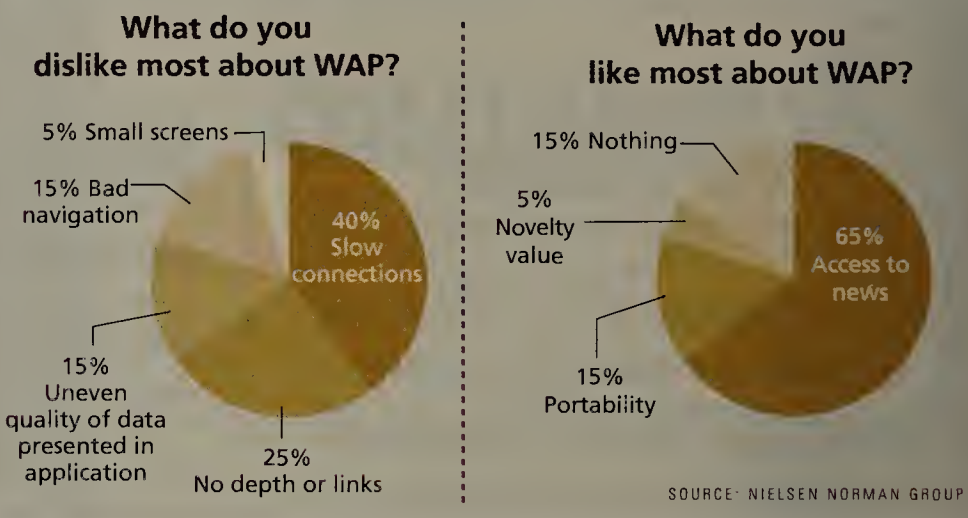
"While it's too early for mobile commerce to become a profit-generating and commercially feasible service, companies must gain experience so if the mobile Internet takes off they'll be positioned to launch a great site," Nielsen says.

Consumer dining portal Food.com, which falls into Kannan's second category, buys into the get-started-now philosophy. It's working with Oracle ASP subsidiary OracleMobile on a hosted m-commerce application it expects to be ready for commercial deployment this spring. "We consider wireless-enabling our online ordering application a fairly

See **M-commerce**, page 82

General impressions of WAP

In a usability study with 20 participants in London, frustration dominated. But users did find some likeable things about WAP-enabled Internet services.



M-commerce transformation

Many IT shops find hiring help to be the best way to tackle m-commerce today.

IT's major task is sorting through the mobile e-commerce mumbo-jumbo and making sense of emerging — and often conflicting — standards, technology and cultural issues. That's followed by deciding what applications are best suited for m-commerce and getting a handle on the development requirements and costs.

Making an existing e-commerce application viewable in any wireless device's screen, a process known as transcoding, is among the biggest technical challenges. That's because the types of wireless devices vary so greatly — Wireless Application Protocol phones, Palm handhelds, Windows CE clients and Research in Motion's BlackBerry pagers, to name a few — and are evolving so rapidly.

Because transcoding requires a rare, specialized skill set, most early movers turn to outsourcers for m-commerce development — wireless application service providers (WASP) such as 724 Solutions, Aether Systems, Air2Web or OracleMobile. WASPs can take simple e-commerce applications and wireless-enable them within two weeks. More complicated transactional applications that require custom development can take several months to create.

Outsourcers get the cumbersome transcoding task — that is, they have to translate data and applications written in standard Web languages such as HTML and XML into formats, such as Wireless Markup Language or XHTML, readable on wireless devices. The onerous nature of this work led the 4-year-old Food.com, a dining portal in San Francisco, to a WASP when it decided to wireless-enable its online ordering application. Food.com earlier had transcoded Web content for use on interactive TV devices, so it knew what a bear transcoding would be for many wireless devices.

"Obviously our burden is in online ordering," says Adam Dubov, vice president of content and product management for Food.com. "We can't keep up with every new device and feature set. Certainly in the short term, it pays to find a reliable technology partner that can keep up with that stuff as well as transcode and host the solution."

Plus, WASPs take care of the integration with the wireless net and the back-end corporate systems.

You'll want to make sure the WASP you chose supports a full range of standards, especially for device compatibility, security, page tags and data synchronization. Be sure the hosting firm offers the functionality you need, be it personalization, location-based services, alerts or voice support.

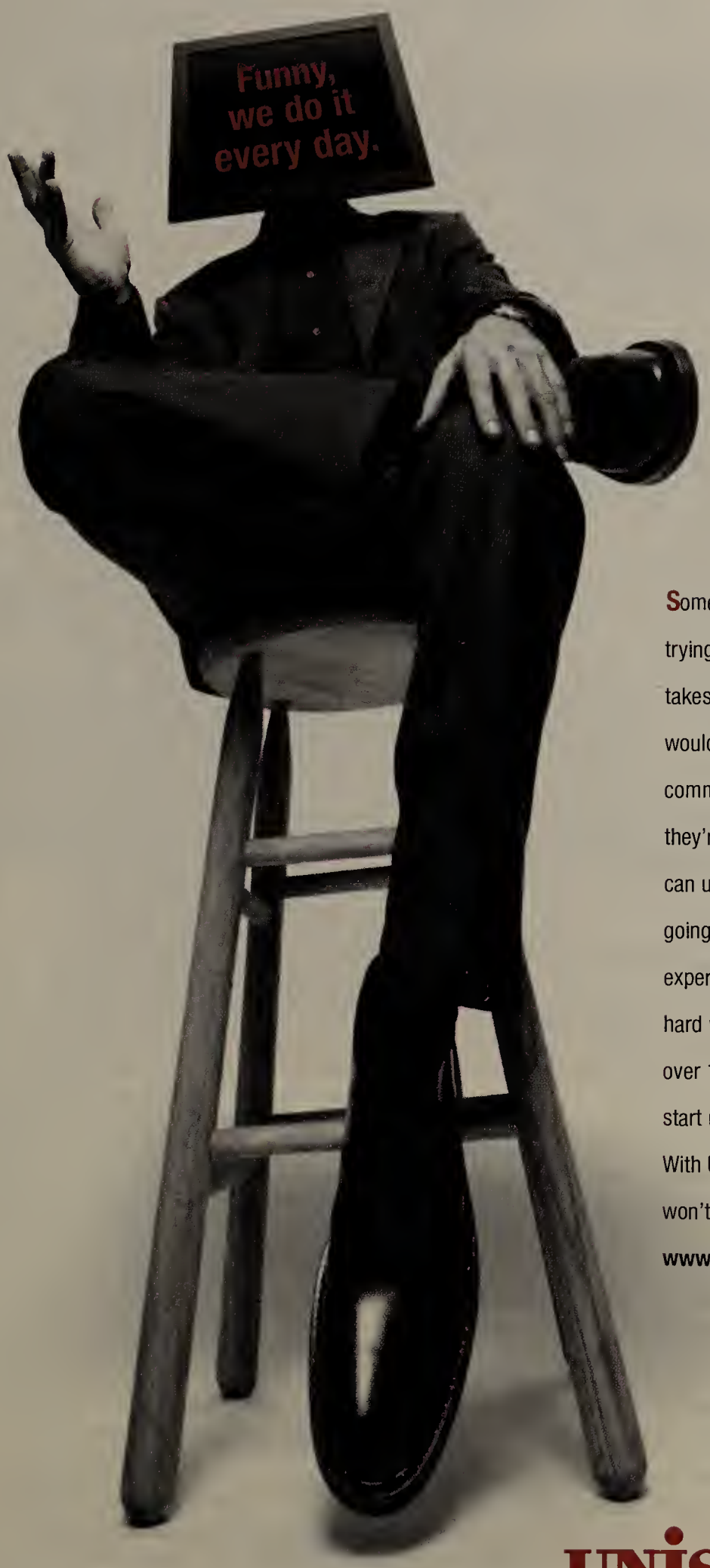
OracleMobile hosts m-commerce applications on Oracle8i database and Oracle9i Application Server Wireless Edition. The iAS server transcodes the data, adapting content into XML and then into the markup language used by the wireless device. Applications can be configured to give device users more control: They can opt-in to location-based services. OracleMobile further offers a development tool called Online Studio, which lets companies build the m-commerce application but host it with OracleMobile. Pricing is charged on a per-user, per-month basis, says Jacob Christfort, CTO at OracleMobile.

Of course, if you're up to the task, you can take on the transcoding yourself. IBM offers WebSphere Transcoding Publisher Version 3.5, which costs $30,000 per processor. You take care of the front-end connectivity and back-end integration. WebSphere Everyplace Suite gets you the transcoding service plus connectivity, synchronization and management components. It is priced on a sliding volume tier scale. At 50 users, the software license carries a one-time charge of $500 per subscriber; at one million users, it costs $18 per subscriber.

Among its customers, IBM claims Sanwa Bank for a securities trading application via a variety of cellphones.

— Beth Schultz

They say, in e-business, it takes forever to unify the past with the future.



Some e-business consultants will tell you trying to integrate your legacy systems takes too long and costs too much. They would have you scrap what exists and commit to whatever vision of the future they're selling that day. Unisys people can unify what you have with what you're going to need, using our decades of experience, ingenuity, and plain old hard work. And we do it every day, in over 100 countries. Today is the day to start unifying your past with the future. With Unisys people there to help, it won't take forever. Visit our website at **www.aheadforebusiness.com.**

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We have a head for e-business.

M-commerce

Continued from page 80

major initiative in the grand scheme of things, but we're not tying any market projections or new market segments to it. It's just too early," says Adam Dubov, vice president of content and product management at the San Francisco firm.

"We're really just looking to start the process and put the building blocks in place so we can unleash m-commerce heavily if warranted."

While dismissing ebullient market projections as overly optimistic is easy, if even a quarter of those predictions come true, wireless will be worth doing for most companies. With its infrastructure requirements, it will never be effortless, or inexpensive.

Factoring in software, hardware, application development and integration, an m-commerce application used by about 50 people, built and maintained in-house, could easily run $500,000 to $1 million, Mobileum's Bishop says.

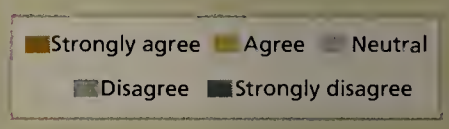
Mobileum's e-commerce infrastructure software package costs $100,000 alone. For that comparatively modest sum, you get all the experimentation and pilot projects you want. Move into production mode, and session fees kick in. A session is an open connection between a handheld device and the m-commerce platform. Mobileum offers two prices, one at 250 active sessions and the other at 1,000 active sessions. At the higher price, the base software costs $195,000 and enhanced wireless service modules range from $95,000 to $125,000. Two developer tools are $50,000 apiece.

Whether you adopt m-commerce today or wait, with this much cash on the line you'll clearly need a strategy. Justifiably or not, m-commerce is already becoming a key differentiation among Web sites.

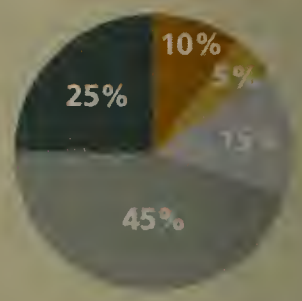
Miss the m-commerce wave and you stand the chance of turning off once-loyal customers looking for a wireless destination. ◪

Long term looks up

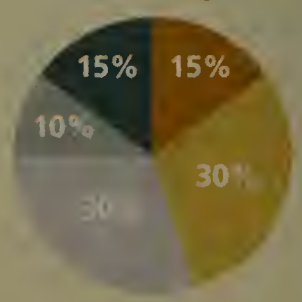
Most of the 20 participants in a WAP usability study in London believe WAP-enabled Internet devices and services will be worth a look in one to three years.



Would you like to have a WAP phone within one year?



Would you like to have a WAP phone within three years?



SOURCE NIELSEN NORMAN GROUP

John Nallin, vice president of IS at UPS, says running redundant data centers isn't enough of a fail-safe. Just as important is keeping the lines of communication between those centers open.

STEVEN VOTE

Plan for the worst, hope for the best

You can build an e-commerce site that never fails. Here's how others have done it. **BY JASON MESERVE**

IN THE BUSIEST SHOPPING DAY OF the year, your Web site — the company's lifeblood — goes down. How did it happen? Will customers return?

Last Thanksgiving weekend, Amazon.com lived this nightmare. The popular e-tailer's site was down for 30 minutes on Nov. 24 and for another 15 minutes on Nov. 30; the company cited software problems. Still smarting from the massive denial-of-service attacks last February, Amazon.com didn't need another service black eye.

No 24-7 global e-commerce company does. An unresponsive site could mean long-term lost customers because "people remember their negative experiences," says Alberto Savoia, chief technologist for KeyReadiness Services at Keynote Systems, a Web monitoring and testing firm in San Mateo, Calif.

Even occasional slow performance is a threat. "If a Web site is slow, a vendor might be losing customers and not even know it," says Savoia, who likens the experience to not complaining to the chef after a bad meal but never returning to the restaurant.

So how do you build a complex e-commerce site that never fails? IT executives running successful Web sites for AmericanGreetings.com, EOS Bank, Monster.com, Penn State University, United Parcel Service (UPS) and the World Wrestling Federation (WWF) say redundancy in core systems is the secret weapon.

"The infrastructure should be 'fail-safe' at any critical point," says Bruce Petro, CIO of AmericanGreetings.com in Cleveland. AmericanGreetings.com is one of the 50 most-visited Internet sites, with more than 8.5 million unique visitors in October 2000, according to Media Metrix, a Web traffic measurement company. Petro says the site serves about six million pages per day during nonholiday weeks and double that amount during a holiday period.

AmericanGreetings.com has had a few growing pains since launching in May 1995, Petro says, but unscheduled downtime has been minimal. For Petro, fail-safe means building in redundancy at the firewall, load-balancing devices, major network switches and its database. If any of these fail, traffic is automatically shuttled to a backup. Other systems, such as servers, send alerts when they approach peak loads.

"We have 250 application and Web servers, which mitigates the impact of any one being lost," Petro says.

Robert O'Connor, supervisor of network architecture research and development at Penn State, says a comprehensive risk analysis "will help you decide where money should be spent on redundancy."

For instance, Penn State uses two internal power supplies but only one uninterruptible power supply for each server. He admits that the choice gives Penn State a possible single point of failure, but adds that those devices are reliable.

A data center or two

Monster.com, UPS and the WWF employ multiple data centers to handle their massive traffic loads. If one goes down, the other takes over. Employment finder Monster.com owns two data centers on separate coasts to handle the roughly 390 million page views it gets per month across the 15 Web sites it operates around the globe, says Brian Farrey, Monster.com's CTO.

Monster.com built its own data centers because most collocation facilities could not meet the company's need for space. It uses 300 Windows NT-based Dell servers and an untold number of Cisco switches and routers. "We're too big for the [collocation facilities]. We scare them away with our size," Farrey says.

Traffic loads are balanced between the two sites, based on geography. Each is serviced by multiple ISP trunks and power supplies. If one goes down, the other can handle the global traffic on its own, he says. The company uses load-balancing devices from HydraWeb Technologies that check for server availability before sending packets, Farrey says.

In addition to distributing load between the two facilities, Monster.com

places its applications across server groups in what Farrey calls "functional clustering." For example, the job search application is spread across 50 servers, 25 in each data center. If one fails, 24 others in the data center carry its load. If a whole cluster fails, the traffic goes to the mirror cluster at the other data center. If both clusters fail, the site's other applications would remain active, he says.

Wrestling with traffic loads

The WWF airs approximately nine hours of television programming per week. If an announcer mentions WWF.com during a broadcast, 100,000 users could hit the site minutes later. In November 2000, the company had 239 million page views across the many Web sites it operates.

"We're running at a very small percentage of capacity, but we have to be ready for the peaks," says Gerry Louw, CTO at the WWF. Louw's approach to balancing load across its 100 Web and streaming media servers is similar to Farrey's, although the network spans less physical distance and uses a collocation service. WWF runs its Web operation out of two Level 3 Communications facilities in New York. The WWF plans to collocate a third data center at a West Coast Level 3 facility later this year, Louw says.

The two main WWF sites — wwf.com and wwfsuperstars.com — are split 50-50 between the New York data centers. Several servers in Virginia (from an earlier outsourcing deal) handle 52 smaller Web sites for individual pay-per-view events and individual stars. Those will be moved to the new West Coast facility.

Within Level 3's racks, the WWF uses 60 Compaq DL360 servers running Red Hat Linux and Squid Web Proxy Cache software for serving HTML content. Six servers deliver streaming media clips with another 34 machines on hot standby for live events. The company uses Cisco routers, switches and load-balancing devices for managing traffic coming to the two main sites.

Louw's rule of thumb is that peak load should never be more that 60% of capacity. If load exceeds that threshold, he brings up more servers. He measures throughput via custom scripting and from the baseline data Level 3 provides.

While the site has never gone down because of traffic loads, the company occasionally has to limit the number of people accessing some of the streaming media content to ensure high-quality viewing experiences. The cap varies depending on the amount of bandwidth being consumed by the total number of users.

Delivering Web content

At UPS, daily hits mount to an estimated 100 million during the holidays. From Nov. 15 to Jan. 15, the company's Internet reliability team meets daily to review performance issues. During such meetings, the team will cover specific trouble tickets, such as a 5-minute slowdown on the West Coast, says John Nallin, vice president of IS at UPS. "On some of these, the problem is resolved before we hear about it."

UPS supports worldwide Web operations with two nearly identical data centers in New Jersey and Georgia. It aims for capacity usage at each location to hover at around 40%, so if one site fails the other could handle the overflow, Nallin says. Factoring in capacity for data center communications is the trick.

"It used to be that you would buy a box to get a little extra capacity, but now you have to buy two boxes for each data center and a box for talking to both data centers," he adds.

The company uses a virtual Domain Name System scheme to direct traffic between the data centers. Load balancing is handled at the ISP and again before the firewall. The Web servers run mainly on Sun Solaris machines, but also on a few NT

ALAN WYCHECK/MPG

Robert O'Connor, supervisor of network architecture research and development at Penn State, says a comprehensive risk analysis "will help you decide where money should be spent on redundancy."

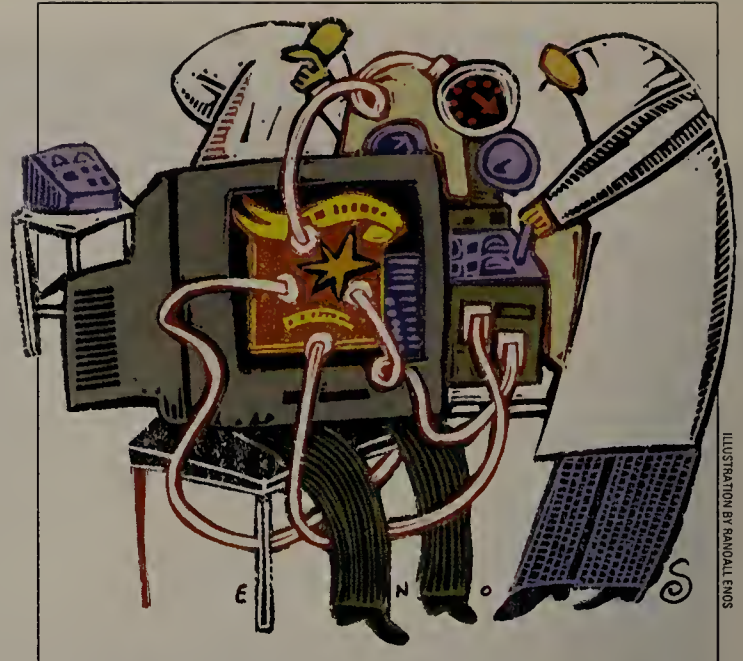


ILLUSTRATION BY RANDALL ENOS

A better response

Testing Web site performance means more than checking for average response times.

In the Web world, much is made out of average response times. But they can't be the only measure of a site's performance.

When a system is under serious stress, you will get weird behaviors," says Alberto Savoia, chief technologist in Keynote Systems KeyReadiness Services group. "Averages can hide those problems."

Savoia equates the situation to sticking one foot in boiling water and the other in freezing water. If you take the average, the feet appear fine. But looking at the individual units tells an entirely different story. With the Web, an average response time of 5 seconds could mean one user experiences a 1-second response time while another has a 10-second response time, an unacceptable delay on the Web.

Savoia characterizes Internet performance problems as:

- Those you can do something about (add more servers and bigger pipes).
- Those you can do nothing about (the Internet as a whole is slow).
- Those you can reduce, but can't entirely control (cache popular content at the edges of the network).

United Parcel Service uses Keynote's monitoring service to keep tabs on itself from the outside world. "It measures us from 15 different locations, and we react," says John Nallin, vice president of IS at UPS.

To test for the problems you can control, Keynote looks at user logs to find out how customers use a Web site. Only some site visitors complete transactions. Others are just looking for information, so they generate less load.

Taking user abandonment into account, Keynote then tests loads based on the average number of people that will make a transaction, browse part way through a site and go to the home page. For companies building test routines, it's important to pound on the site like normal users would, not like 100,000 people going through the entire process.

Savoia says this gives a more accurate view, so problems will be more easily detectable.

— Jason Meserve

servers. Applications such as package tracking and signature capturing run on IBM AS/400 servers and 15 IBM 3090 mainframes at two locations. "With 100 terabytes of data, you don't run on dinky Unix boxes," Nallin says.

One shift per day, UPS operates one data center from the other for practice. This way, if a snowstorm in New Jersey keeps workers at home, any problems at that data center can be handled by the engineers in Georgia, for example, Nallin says.

Keeping ahead of capacity

To measure capacity and monitor performance, UPS uses a combination of reports from Keynote Systems and data from a custom-built application that tracks application and proxy server performance.

"We traditionally see a growth in activities of about 100% per year," Nallin says. "We see it incrementally as you go from quarter to quarter and half year to half year. We always have staging and provisioning equipment come in [throughout the year]."

> "We traditionally see a growth in activities of about 100% per year."
>
> JOHN NALLIN
> VICE PRESIDENT OF IS AT UPS

EOS Bank, an online-only bank, plans capacity based on business growth projections. The bank builds for triple its customers, which it expects to number 300,000 within the next three years. "We won't run out of capacity before we can add more," says CEO Roy Henderson.

Outsourcing was cheapest for EOS. It houses its back-end servers at Exodus Communications' El Segundo, Calif., facilities. The Web server applications are operated by Home Accounts, a spinoff of credit card processor FDR. Its servers are connected via multiple T-1 lines to prevent any single point of failure.

But the best plans can still result in problems. When Penn State brought its grade-checking system online about three years ago, it had a vendor build load-balancing software to equalize traffic across multiple servers. The custom code worked poorly, and the servers began crashing. "We had two students sit in front of the servers to restart them if they crashed," O'Connor says.

Needless to say, Penn State threw out the third-party application. Now it uses IBM's Enterprise Network Dispatcher.

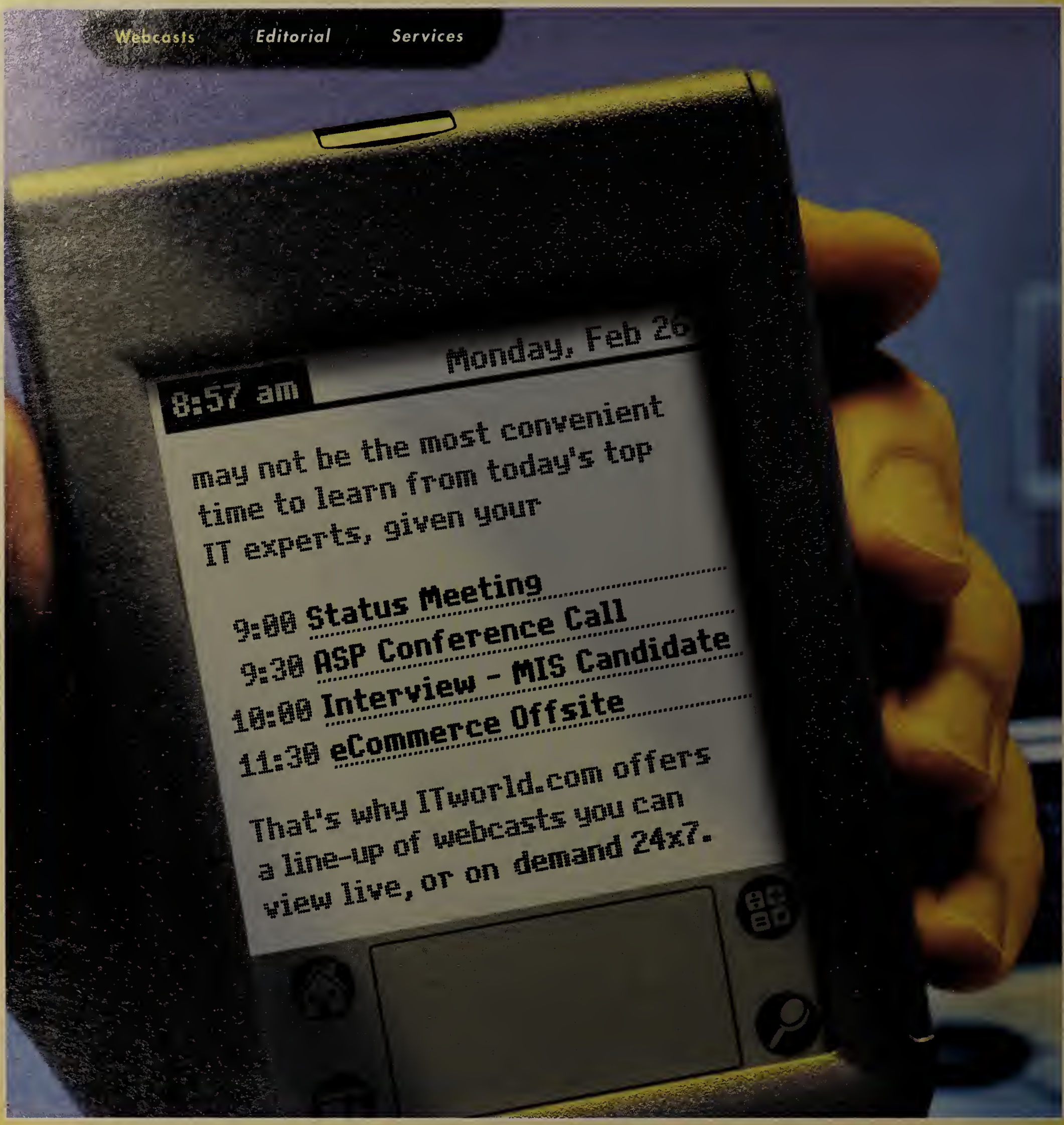
Planning for performance

Many bottlenecks can be attributed to bad system configurations between products from different vendors. Keynote's Savoia says a company could spend $10 million on a system that acts like a 500-MHz Pentium connected to the Internet via a 28.8K bit/sec modem. "The solution could be as simple as making a configuration change in a Cisco router and getting back up to full power," he says.

For Monster.com, this means testing applications with Segue Software's SilkTest regression testing software before anything goes live. "We like to do a basic performance smoke test before we put an application into production," Farrey says. "It helps to get a warm-and-fuzzy feeling that the application can handle the traffic."

Still, try as you might, you can't control all load-related problems. "You don't have control over all the components that control your service levels," UPS's Nallin says. "AT&T and UUNET could be having problems, but to the end user it looks like you. There's no control over that."

But if you've built for plenty of capacity and have redundancy at the critical junctures, then you've done more than simply hoping for the best. ◪



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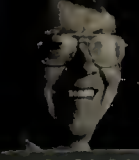


"Effective Internet selling is about integrating robust Web site content with traditional contact [methods]. A good example is Dell, which still mails out catalogs." Bob Davidson, vice president of pricing and marketing for ABF Freight System, 2001 E-comm Innovator of the Year Award winner. See story, page 52.

AM FRANCIS

E-comm picks and pans

Our annual look at what's right — and wrong — with e-commerce. BY JULIE BORT

ite that sells the most unusual wares: Stupid.com

For those yearning for truly unique purchases, no site surpasses Stupid.com. Its wares include The Pregnant Woman key chain (which depicts a baby in utero), pig measuring cups and underwear made out of bubble gum. Appropriately, it bills itself as "a complete waste of perfectly good technology."

Example of e-comm hysteria at its peak: Pets.com

Pets.com could be the poster child for the dot-com era. It banked $66 million in venture funding in 1999, went public in early 2000 and spent lavishly on TV ads like a $2 million Super Bowl spot. Its one, seemingly minor, hitch was that it had no market. People don't want to order dog food over the Web. Three months ago it earned the distinction of being the first publicly traded dot-com to close shop completely. The once-prized real estate, Pets.com, is now operated by brick-and-mortar retailer Petsmart.

Site that sells the strangest service: Lido.com

This site lets subscribers download more than 10,000 medically accurate, full-color illustrations of the human body and, even more interesting, the human body after an injury. Pitched as a service to lawyers — the personal injury type, of course — it is also seemingly popular with criminal forensics folks. It's a site for sore eyes.

Sites most worth braving a horrid WAP interface: Godiva.com and Edmunds.com

Godiva offers Wireless Application Protocol-enabled phone users a nifty store locator, a real problem solver when out and about and a chocolate attack hits. Equally handy is Edmunds, an auto-shopping advice site. While cruising the car lot, who wouldn't rather punch dozens of cell phone keys for answers to questions than deal with a smirking salesperson?

Site that proves bad advertising makes a bad idea worse: E-stamp.com

As of last November, you can no longer buy postage over the Internet from E-stamp. It phased out its Internet postage operations after spending $20 million on a hokey ad campaign that featured home-office stamp buyers. It's not out of business entirely, though, the company still sells logistics software.

Best consumer bargain: PrePaidLegal.com

For less than $25 per month in most states, PrePaidLegal.com gives people access to a lawyer who can assist in common legal problems. The company uses its Web site to sign on new clients to this nationwide legal co-op of sorts and answer questions on items such as contracts or wills.

B2B site with the farthest-reaching potential: Incyte.com

Know any scientists in need of a clone? Point them to this e-commerce site, from which they can order one. The site, based on the Genome Project, hosts a pay-on-demand database of 60,000 genes. The site identifies genes, offers data on their characteristics and models sequences. Likewise, Incyte.com also sells clone-making equipment, in the form of "proprietary cDNA and genomic clones."

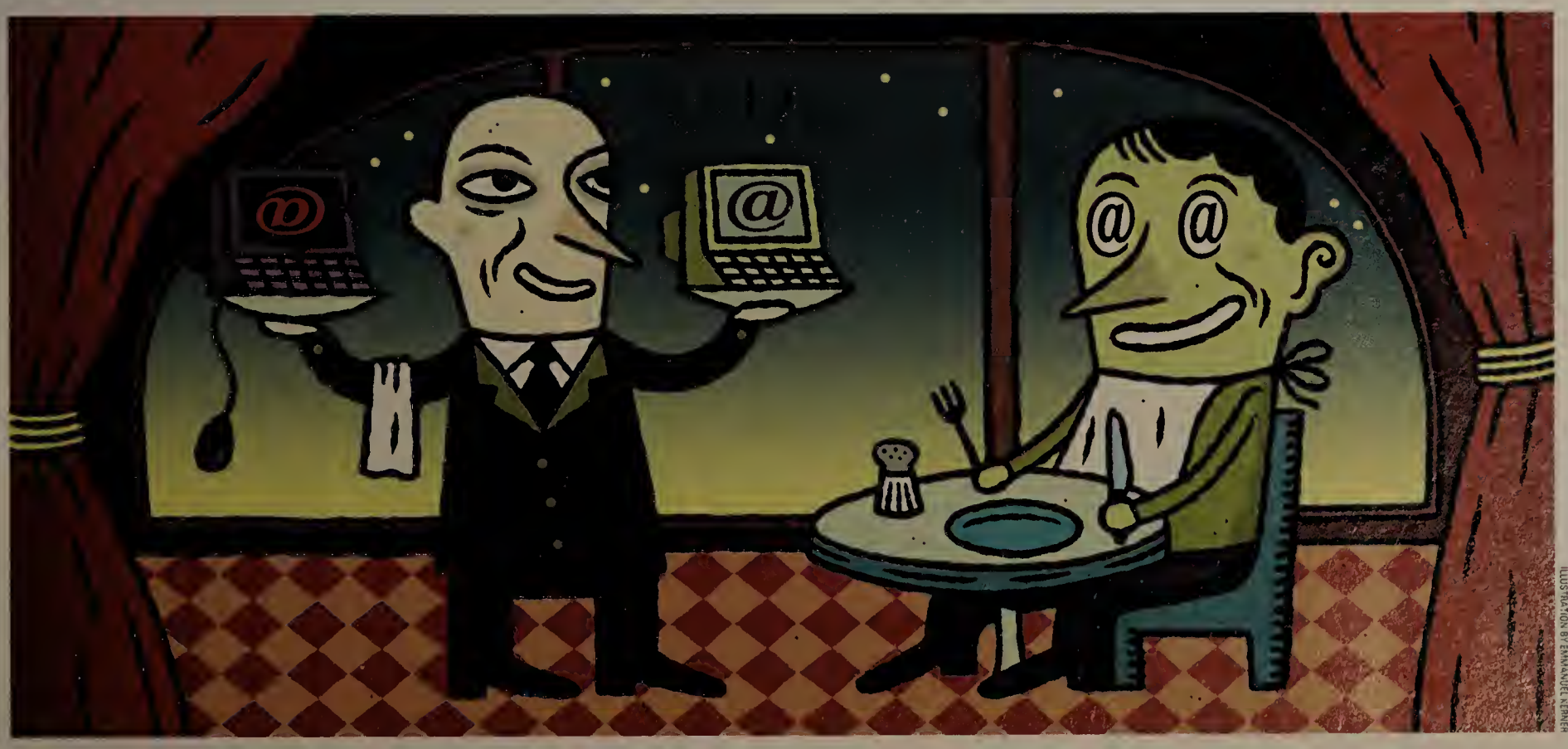
Best place to find business bargains: Bigvine.com

This bartering hub lets businesses trade what they have for what they need. By paying Bigvine.com a 3% or 4% fee on the estimated value of the product or service, businesses can trade for hundreds of items. These range from industrial equipment to fax machines.

Best example of intelligence — and counterintelligence — on the Web: Spytechagency.com

With night vision binoculars, wristwatch cameras, voice analyzers and lie detector software for sale, this site is a must for anyone planning intrigue of the James Bond variety. If the spy gadgets aren't enough, you can hire a private investigator or sign up for a home study spy course, too.

Network World Fusion Executive Editor Adam Gaffin contributed to this report.



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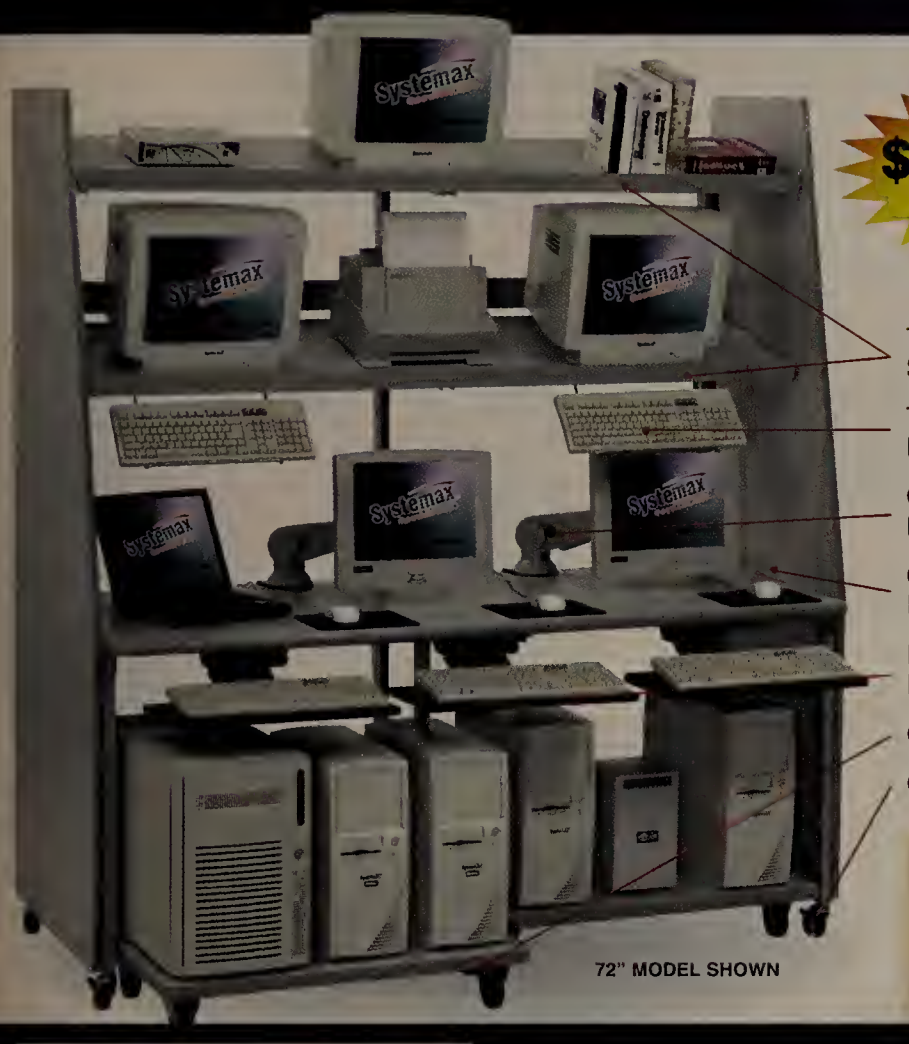

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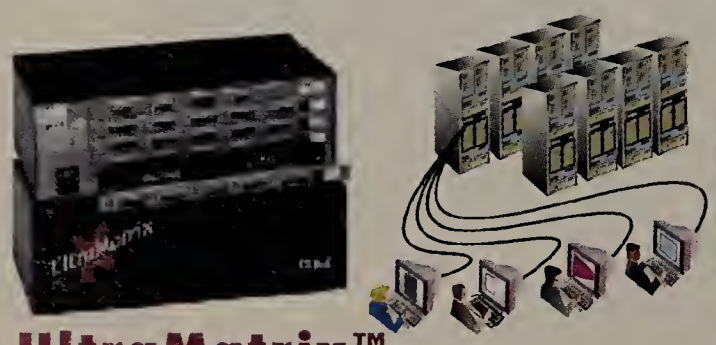

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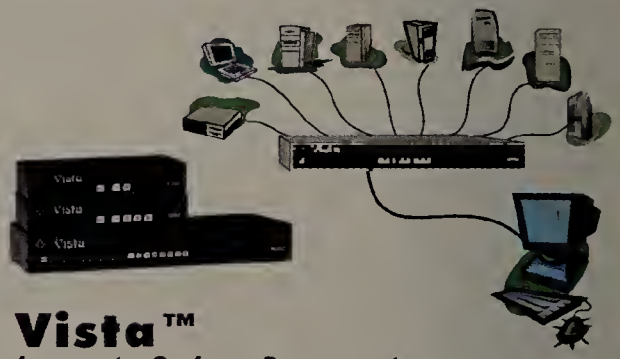

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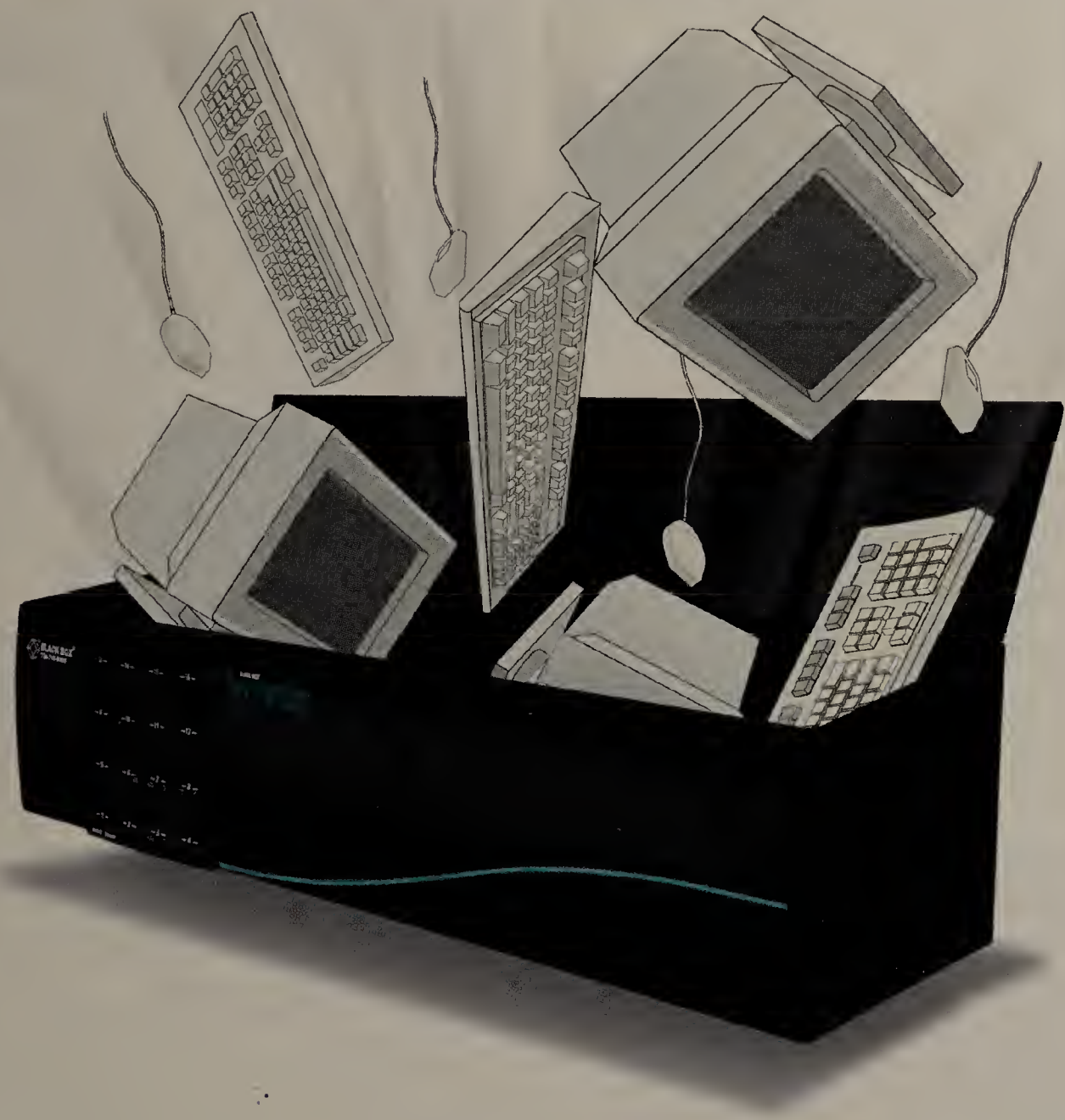

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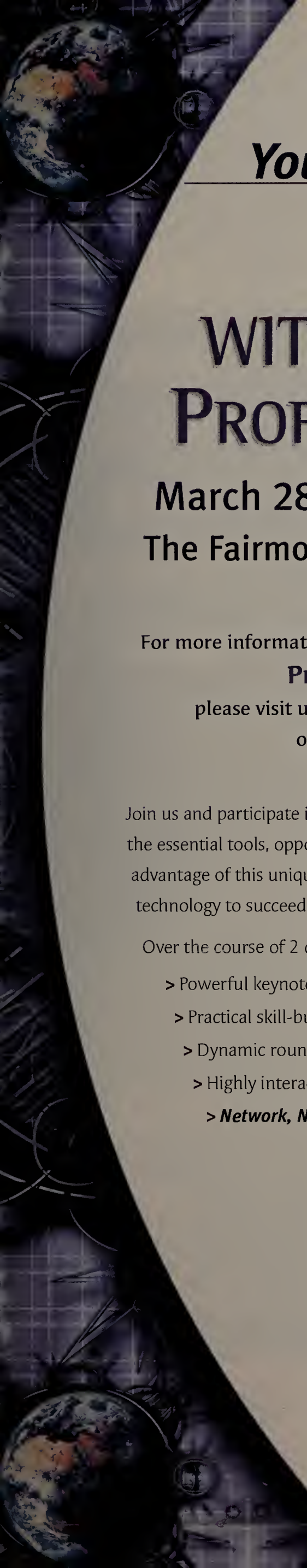

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KEVIN WHEELER, GLOBAL LEARNING RESOURCES, INC.

The critical value of metrics is in the eye of the beholder. Do you know who your stakeholders are?

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What you can do to plan, prepare and promote critical relationships in the hiring process.

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If your competitors succeed in hiring 23% more college students this year, will there be any left for you?

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Diversity - What You Need to Do to Tap "All" the Top Talent

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Top employers benchmark how diversity has become a core value to attracting and retaining top talent and keeping a competitive edge. Moderator, Preston Edwards, Chairman and CEO, IMDiversity.com, and Black Collegian Magazine, is nationally known for his 30 year commitment to diversity education. He has been honored by numerous organizations including the 1999 Pericles Award from the Employment Management Association.

What You Really Need to Know About Resume Management Systems or, How to Tell "Real Ware" from "Vaporware"

MARK MEHLER, MMC GROUP

The worlds most competitive corporations discuss the pros and cons of choosing and using emerging technology tools and systems. Moderator: Mark Mehler, President, MMC Group. Mark is an international consultant on high-volume staffing processes, a sought after speaker at national recruiting conferences and co-author of CareerXroads.

Town Hall Forum: Pundits, Puns and Pulled Punches

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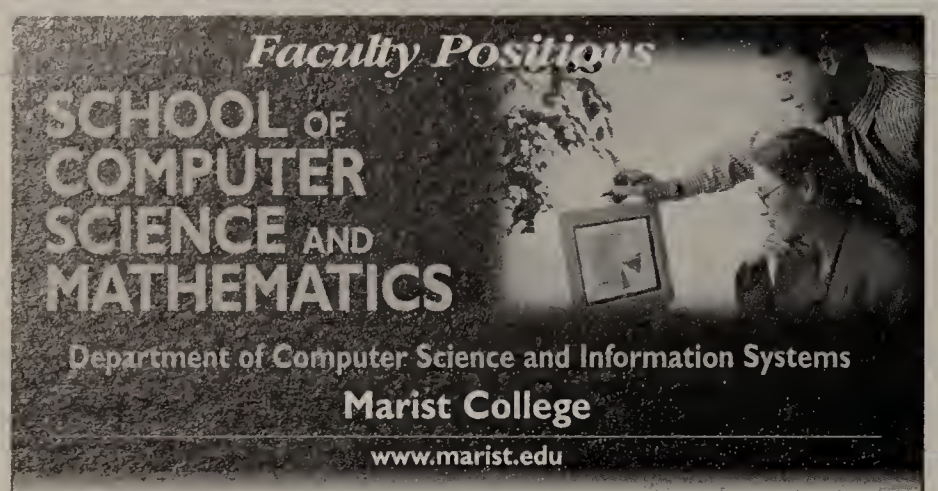

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Software Engineer to research, design & develop computer software systems for manufacturing and other industries applying principles & techniques of computer science, engineering & mathematical analysis using various operating systems, C, C++ & OTHER PROGRAMMING LANGUAGES. Req. B.S. or Engineering degree in Computer Science/equivalent plus 6 yrs of exp. or Masters/equivalent in Computers & 2+ yrs. of exp. 18+ months exp. in C, C++, DOS, OS/2, UNIX, MS Windows, VAX/VMS & AIX. $70,000 p/a. Send resume to Playekar Companies, Inc., 1959 East Third St., Williamsport, PA 17701.

Software Engineers, Programmer Analysts, Database Analysts needed by MA. based IT firm. Please apply with 2 copies of your resume to H.R. Department, (Enterprise People, Inc., 109 Mayfair Drive, BoxBorough, MA 02188

Systems Analyst - Needed immed. (2) to develop, code, test & maintain information systems & integrate with DB's for clients in NY/NJ area. Provide tech support as needed. Know Win NT, Oracle, VB, SOL. $80,000/yr. Bachelor's and 2 yrs. exp. in any IT field. Fax res. to 973-366-1536.

Systems Analyst needed by fin'l firm in NY. Must have Bach Deg/Equiv in Comp Sci & 2 yrs exp in dsgng, dvlpg, testing, implmtg & supporting in-house business applics for municipal bond/structured finance industry. Skills reqd incl: Erwin, Gupta/Centura, Seagate s/ware, Open VMS, Oracle Database, Case Modeling techniques, Object Oriented dsgn & prgmg, relational d/base concept & dsgn, PL/SOL & C. Ambac is an EOE. Respond to Recruiting, HR Dept, Ambac Assurance Corp, One State St Plaza, NY, NY 10004.

Translator (Technical Materials), in Denver, Colorado: Translates software from French to English and vice versa using correct word meanings, sentence structure, grammar and punctuation. The translations include technical documentation, help files, brochures, press releases, demo scripts, marketing and promotional materials. Requirements: B.S or foreign equivalent in foreign translation. Must speak, read and write English and French. Salary: $47,187 annually for 40-hour workweek. Applicants should mail their resume to: Colorado Department of Labor and Employment, Employment Programs, Attn: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe St., Denver, CO 80202-2117. Refer to Job Order No.: JL1117292.

Senior Software Engineer sought by a computer software consultancy in Colorado Springs, CO to work in Costa Mesa, CA & other unanticipated job sites in the US. At a senior level, engage in full life–cycle software development. Specifically, design & development client/server & web–enabled software applications that interface with ORACLE & other relational database management systems. Analyze requirements. Create designs & design documentation. Code, test,& de–bug the software applications. Engage in project management as needed. Use PL/SOL,C, Pro*C,JAVA,& JAVA script in the design & development process. Provide technical assistance to other software engineers. Requires a Master's degree or equivalent–specifically, requires a master's degree in comp. sci., bus., electronics & communications or a related field, or its foreign equivalent, plus three years of progressively more responsible software development experience; or, a bachelor's degree in comp. sci., bus., electronics & communications or a related field, or its foreign equivalent, plus five years of progressively more responsible software development experience; working knowledge of ORACLE relational database management systems, PL/SQL,& C. 8am-5pm,M-F;$66,500/yr.(2 openings.)Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II,#400,1515 Arapahoe, Denver, CO 80202,& refer to Job Order Number JL1117226

Software Engineer sought by information technology consulting company in Denver, CO to, at a senior level, engage in full life-cycle software application development & enterprise wide integration of diverse software applications(front-end to back-end). Analyze requirements. Create designs & design documentation. Code, test,& debug the software applications. Use object-oriented design techniques & CORBA based development tools & JAVA in the development process. Mentor other software engineers. Requires Master's in Computer Science or related field(including Physics);1 yr experience developing computer software applications using object-oriented design techniques & CORBA based development tools; Working knowledge of JAVA programming. $66,200/yr; M-F; 8am-5pm. Respond by resume to James Shimada, CO Dept of Labor & Employment, Tower II,#400,1515 Arapahoe St., Denver, CO 80202,& refer to Job Order No.JL1117283.

Applications Developer. Design, develop, implement, and maintain interactive e-commerce and web-based applications using Java servlets, object oriented design methods, relational database management systems, Oracle database design methods, Oracle Dataload utilities, networking protocols, C/C++, and Perl in a Unix environment. Bach. degree in C.S. or sim. major req'd, as is 2yrs exp. in job offered or an appl. devel. position. Must have 1yr exp. using C/C++, Perl, or Java. Multiple openings. Frequent reassignments throughout US. Resumes to: NIC USA d/b/a Utah Interactive, File R & W #2406.02, 68 S. Main St., Ste. 200 Salt Lake City, UT 84101.

COMPUTER PROGRAMMER is needed to perform the following duties: converts data from project specifications and statement of problems and procedures to create or modify computer programs; analyze workflow chart and diagram, applying knowledge of computer capabilities, subject matter and symbolic logic; converts detailed logical flow chart to language processible by computer; enters program codes into computer system, using Pascal &C; inputs test data into computer; corrects program errors, using methods such as modifying program or altering sequence of program steps. Must have a Bachelor's degree in Computers or Engineering. Must also have at least 2 years of work experience in System Engineering. Salary will be $29.46/hr & overtime = x1.5/hr. 40 hrs per week (9am - 5pm). Applicants must show proof of legal authority to work in the U.S. Please send your resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Stree - 7 North, Chicago, Illinois 60605; Attn: Bert Grunnet; Reference # V-IL 24812 - P AN EMPLOYER PAID AD. NO CALLS - SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

Software engineers. Design/implement client server on Multi-hardware/software for telecommunication. Determine feasibility of design and interface software / hardware. Tools, RDMS, 4thGL, GUI, C/C++, JAVA. Other position, design/develop full life cycle 3-tier server network routing applications. determine feasibility of design and interface software/hardware. Tools, C/C++, and JAVA. on a UNIX Job location, FL. MO. MS with 1 yr. or BS with 4 yr. exp. Send resume to Mithra Amaran, JMA-IT, 6405 Metcalf, #514, Overland Park, KS 66202

Software Engineer, Quality Assurance: Uses various electrical and software engineering methodologies and techniques to create and establish quality test procedures to be used for various products and/or tests software. Coordinates related quality assurance activities including the development of software testing procedures which will be used to insure that manufactured products are in compliance with technical specifications and other related engineering parameters. Establishes and elaborates defect control systems which will be used in the automation of software testing. Required: Bachelor's degree in Software, Electrical or Biomedical Engineering. $38,000/year; 40 hrs. week, 8:00 a.m.-5:00 p.m. Two copies of resume to: MIKE BROOKS, DWE-ALC; P.O. Box 7972, Madison, WI 53707-7972. Reference file #C101878.

Technical Consultant: Conducts systems analyses for development of internet applications. Applies distributed computing concepts and develops systems architecture utilizing Visual C++, BTrieve, Oracle, MS SOL Server, Java, Enterprise Java Beans, Java Beans, Servlets, JDBC and JSP. Position requires 2 years experience in the job duties and bach. degree or equiv. in computer science. Must have proof of legal authority to work permanently in U.S. Position based in Tulsa, OK and on-site customer locations in Tulsa metro area. Send resume to D. Conner, Human Res., Leapnet, Inc., 401 South Boston Avenue, Tulsa, OK 74103, Fax: 918-764-1950, E-mail: dconner@leapnet.com.

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Programmer Analyst. Sought by Woodridge, IL software development company to work in various unanticipated locations throughout the U.S. Under direct supervision, plan, develop, code, test and implement software applications. Evaluate user request for new and modified programs and design software accordingly. Use of CICS, VSAM, IBM 3090, UNIX and SQL/DS. Reqs. Bachelor's in Computer Science, Computer Eng. Electrical or Electronic Engineering, Mathematics or its foreign equivalent in education. Plus 2 years in the job offered or 2 years in a related occupation including Programmer or Software Engineer. Related exp. Must include use of CICS, VSAM. IBM 3090, UNIX, and SOL/DS. $61,921.60/year, 40 hrs/wk, 8:00AM-5:00PM. Applicants must show proof of legal authority to work in the US. Respond by resume to: Illinois Department of Employment Security, 401 South State St.- 7 North, Chicago, IL 60605, Attention: Bert Grunnet, Ref. # V-IL 24816-P "an employer paid ad". No calls – send 2 copies of both resume & cover letter.

Programmer/Analyst: Develop and produce source code required in the operation of company's CADWorx software products used in the design and drafting of piping and instrumentation in the power and process industries using C++, AutoCAD and Database programming. Provide support for CADWorx software products. BS in Comp Sci. Comp Engg. or Engg Tech & 6 months exp. Send resume: HR Dept., Coade, Inc., 12777 Jones Rd., Suite 480, Houston, TX 77070.

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An information technology services company needs a Manager for its software development and delivery activities. Requires a master's degree or its equivalent with a major in business administration, accounting or computer science plus 2 years experience as a manager software development or in any occupation involving software development. Send resume: HRM Department, Integrated Information Services, Inc. 2100 W. Big Beaver Road, Ste 101, Troy, MI 48084.

Eatel, a provider of telephone and communication services, has multiple openings for qualified **Information Technology Professionals.** For consideration, please contact: Eatel, 913 South Burnside Ave., Gonzales, LA 70737-4258 Attn: Information Technology, Job Code 888 or call Trisha Guidroz, Phone (225) 621-4250. EEO. AAP

Hot Skills: C++

C++ is among the leading languages of information technology in 2001. Industry leaders say the language remains critical in an IT world that is coming back after the past year with a different look, one where ever-bigger organizations will be using the web in still bigger ways.

Aztech Professional Services, Inc.
Phoenix, AZ

Kent Dicks started Aztech Professional Services five years ago, basing his business model on observed best practices when working at Texas Instruments and American Express. Though a relatively small organization of 100 employees, Aztech provides IT consulting and headhunting services to the Fortune 1000 and state agencies. A major Fortune 50 financial services company has recently named Aztech a nationwide, preferred vendor in nine U.S. cities.

"We stand side-by-side with much larger firms."

Kent Dicks
Aztech Professional Services, Inc.
founder

"We stand side-by-side with much larger consulting firms," says Dicks. "Our model allows for open and honest communication with our employees. There is no aspect of their contract employment that is not shared with them, including the bill rate to the client for their services."

Aztech employees pick and choose their benefits, including medical, dental, relocation, training, 401(k), paid time off, bench time and much more. Each employee receives a free Sam's Club or Costco membership and $250 toward a fitness center membership each year. "We want our employees to get the most out of their compensation plan," says Dicks. "If an employee already has benefits from an alternative source, like their spouse, then we pay them for the benefit."

While Aztech insists on a confidential agreement to protect client proprietary information, the firm does not require employees to sign non-compete agreements, which is widespread within the consulting industry. "A majority of consulting firms use non-compete agreements to handcuff their employees," says Dicks. "We think our approach makes for a much happier employee."

Aztech focuses on providing hard-to-find technology resources. The firm provides flexible resourcing for clients in a contract capacity. Should the client and contractor desire, a transition can occur to become an employee of the client company. "Many clients and contractors prefer this method of employment, because it allows both parties to work together before making a formal commitment to employment," says Dicks. "Our overall goal is to provide independent thinking and more experienced contractors for the dollar the client invests."

Currently Aztech works with clients in many capacities, including financial services, telecommunications, semiconductor and aerospace. A majority of Aztech's contractors are working in some form on strategic e-commerce projects, in either development, project management, architecture, security or systems administration.

Aztech will, in 2001, hire individuals with C++, C, Java and WebSphere technical skills, to name a few. "We make sure our contractors are in a challenging assignment, where they are able to learn and grow," says Dicks. "Aztech contractors ask for assignments that will expand their depth of knowledge, and provide more challenge. We don't just fit people into their routine mold. It's not about just making a sale, it's about building long-lasting relationships with the employees and clients. If an employee is happy in their assignment, the client is generally kept happy. It's a win/win.

"The market has changed dramatically over the last year. After Y2K, we expected and started to see such a demand on e-commerce skilled individuals. Contractors just entering the market with less than one year of experience were asking for six-figure salaries and stock options with pre-IPO dot-coms. Now with the failure of many dot-coms, the shyness of the venture capital firms to fund and the outsourcing to other countries, the e-commerce resources are in more supply. The emphasis has switched, and IT experts are more interested in getting their hands on state-of-the-art technology and experience, at least for the time being."

iPolicy Networks
Fremont, CA

iPolicy Networks has a business proposition that is resonating across the industry. A producer of purpose-built systems with proprietary technology, iPolicy Networks is developing a carrier-class product for service providers that allows them to deploy advanced IP networking services. "Our product will allow them to provide the service from their location as opposed to the more conventional approach of placing hardware at the customer premise," says Mark Housman, iPolicy Network's vice president of marketing.

Housman says this is the next generation. "It's the next step to build a purpose-built platform to operate at the service providers' edge," says Housman. "We're providing a multi-gigabit product that operates at optical speed."

Housman says the company will hire approximately 60 IT professionals with C++, C and Java expertise to develop its products, as well as developers for the embedded software. "We have a variety of positions open, and coming here will allow you to learn and participate in something as it develops. We're building a complete system, to include planning, development, design, architecture – all the way through validation.

"We are a start-up, but we're building a product that is in the sweet spot of this market space."

Mark Housman,
iPolicy Networks
vice president of marketing

"We are a start-up, but we're building a product that is in the sweet spot of this market space," says Housman. "We have a strong idea about how service providers can provide a deeper value for their customers. We also have a group of people who have done this – and have a proven track record, through the people who work here, for executing."

Housman says the company is a right fit for people who are energetic and who want to excel. "It's an opportunity for engineers to work on a leading-edge product, to advance their skills, as we do things that haven't been done before, and we have a lot of fun doing what we're doing."

Network World, Inc.

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Active Directory fix to require significant upgrade

BY JOHN FONTANA

REDMOND, WASH. — A key security flaw in Microsoft's Active Directory pointed out more than 12 months ago by early adopters won't be patched for nearly another year.

What's more, enterprise users will have to upgrade all their directory servers, known as domain controllers, to the forthcoming "Whistler" version of Windows 2000 to activate the patch.

Observers say the security flaw, which can cause changes to user groups to be dropped before being recorded, tops the list of issues that need to be addressed in Active Directory.

Until the flaw is fixed, Microsoft says the workaround involves procedural policies for administering the directory.

The flaw centers on the requirement that administrators manage user groups as a single entity, or attribute, and not by individual user, a concept called "multivalued attributes." Multivalued attributes force administrators to update an entire attribute, or list, to add or delete even a single user.

If two administrators make changes to the same list, one set of changes is tossed out during replication as part of conflict resolution.

One result could be that a user deleted from a group membership by one administrator could be returned to the group and retain group access rights and permissions due to the work of another administrator.

"We have been doing little tricks so the risk is only a local problem, and we only have a small chance of a security failure," says a systems analyst for a large multinational oil and gas company who asked not to be identified.

The systems analyst says the trick is to centralize administration of group membership lists: "We use good people processes to work around what is a technology failure." The systems analyst says the problem is a top security issue and "if we have to upgrade to Whistler, then that's what we'll do."

But it appears not many users know that's what they'll have to do.

Microsoft said a year ago the issue would be resolved in a Service Pack, widely believed to be Service Pack 2, which will be released in the next few weeks.

But after the company discovered what was needed to correct the problem, the fix was added to the feature list of Whistler, which Microsoft expects to have out by year-end.

"At some point, Microsoft switched its story. The question is how many people understand this is an issue, and of those, how many understand that it won't be fixed until Whistler. Further, how many understand that it will require all of their domain controllers to be upgraded to Whistler?" asks Neil MacDonald, an analyst with Gartner Group.

Microsoft says users are aware of the issue and pointed to a 400-word passage in a more than 1,150-page deployment guide as proof the issue has been explained to users.

But the timing of the fix has not been formally announced because details of the planned Whistler beta-test version are not publicly available.

"It sounds like another issue that might further slow the pace of enterprise migrations" to Win 2000, says Josh Canary, Win 2000 business manager for consulting firm Collective Technologies.

Microsoft, which now calls the issue "link value replication," says prudent users are not experiencing problems.

"I don't think this fix is something customers are shopping for or that it is holding up deployments," says Shanen Boettcher, product manager for Win 2000. "Work on Whistler is evolutionary, and there isn't a single feature that will force changes to configurations of domain controllers."

Microsoft says the best way to avoid the problem is to make all group membership changes on a single domain controller, which prevents replication conflicts. ◪

Win 2000,
continued from page 10

was 582M bit/sec vs. 581.

Microsoft says the comparison is not apples-to-apples.

"Their methodology and configuration is unable to yield similar results . . . because of constraints introduced by their testing methods," says Steven Adler, product manager for Win 2000.

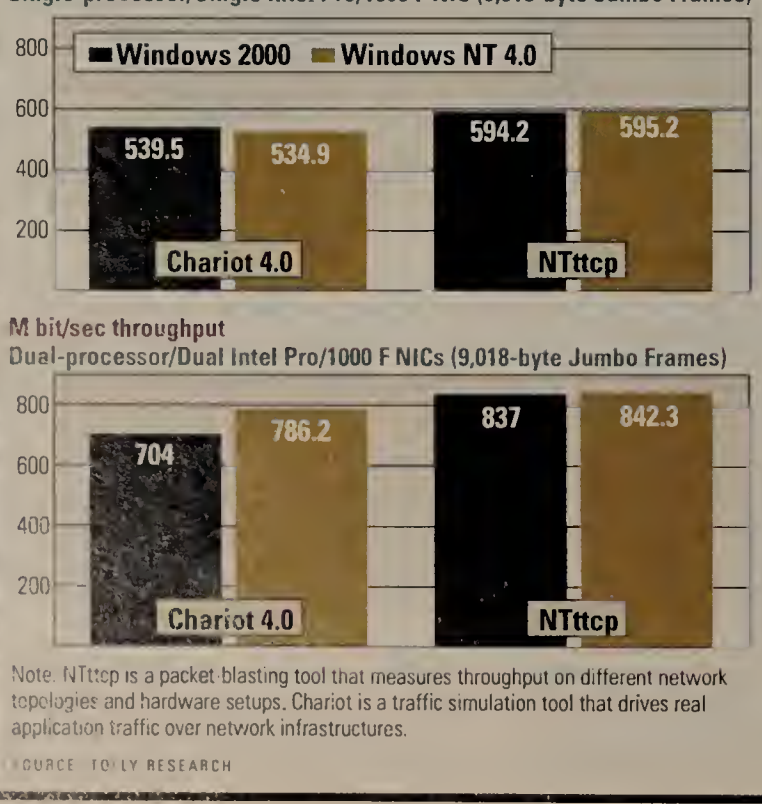
One key, Adler says, is Tolly used some NT 4.0 clients, which lowered throughput because they don't have a TCP/IP stack optimized for Jumbo Frames and off-loading work to a NIC.

"We are not in disagreement with their results, but we do strongly disagree with the conclusions they have drawn," he says.

The conclusion, Tolly's Eichman says, is that "your own environment, topology and switch architecture will dramatically affect your results." ◪

Gigabit Ethernet shootout

Tolly Research found in its testing that Microsoft's Windows NT performs on par or better than Windows 2000 when measuring Gigabit Ethernet throughput.



Note: NTttcp is a packet-blasting tool that measures throughput on different network topologies and hardware setups. Chariot is a traffic simulation tool that drives real application traffic over network infrastructures.

SOURCE: TOLLY RESEARCH

Sync,
continued from page 16

and e-mail; then file sharing and systems management data; and finally enterprise applications.

Like most other synchronization vendors, Synchrologic is only now expanding into wide-area wireless support. Some products, but not all, currently run over 802.11b wireless LANs. Synchrologic will add wireless WAN support to its www.readysyncgo.com portal in a few weeks and to both its server products in a few months.

Another vendor, Extended Systems of Boise, Idaho, is working on a version of its Extend-Connect Server software that is designed for wirelessly connected handhelds. A key part of the new release is a store-and-forward messaging system that can handle the vagaries of glitch-prone, low-bandwidth wireless connections.

"Right now, synchronization is point-to-point," says Steve Wood, research and development project manager for the company. "Our next-generation [software] will let us sync anything to anywhere."

SyncML, a specification backed by Cisco, Lotus, Nokia and more than 500 other companies, is supposed to advance Wood's goal of interoperability by creating a uniform XML-based technique for synchronizing data. But even SyncML points to difficulties.

"Lotus Notes has something called 'recurring appointments,' " Wood says. "But Palm doesn't handle these. This [kind of problem] will be a challenge to SyncML. How do you map disparate feature sets to different devices?"

These are just some of the problems. Observers say the apparent ease of slipping your Palm device into its cradle wired to your PC, and moving some phone numbers and schedule changes back and forth, has ill-prepared handheld users for the challenges of managing distributed data.

"There are major league problems with" mobile data synchronization, says Dale Gonzalez, vice president of wireless development for Air2Web, an Atlanta wireless application service provider. The traditional difficulties of replicating data are compounded by unreliable, low-bandwidth wireless networks, which might lose part of a record or drop a database transaction halfway through the update. The transmission of data has to be minimized and even more managed. It needs to be sent in small chunks and be able to restart after a dropped connection without the entire update being sent again.

Dynamic data, such as changing inventory or package shipping information, is the worst for synchronization, Gonzalez says.

It's better to keep such data on a server and let users, if they must, wirelessly access it via a browser. Data that changes rarely is better-suited for synchronization, but users need to ask themselves how valuable is this data and how necessary is it to wirelessly synchronize it?

"Why not use a cradle?" Gonzalez asks. "If the data changes, say, every Tuesday at 6 a.m., just tell all your users to dock their handheld in its PC cradle and synchronize at 6:30." ◪

VPN,
continued from page 18

Sccure's management platform.

With thc agcnt installed, NetScreen devices can be provisioned, monitored and managed remotely, making it easier and less expensive for OneSecure to set up VPN and firewall services.

The deal means customers who buy their own NetScreen gear to build a VPN could have OneSecure take over managing it later if that is an attractive option. The user would retain the ability to view management data about the devices.

Fiberlink, a service provider selling VPN service for dial-up and dedicated lines, says it will announce this summer an alliance with a software firewall vendor to include firewall protection as part of its VPNterprise service, says Skip Taylor, vice president of business and product development.

The company is in trials to consider thumbprint checks as a way to authenticate users to the corporate VPNs. Users traveling with laptops would roll their prints on a pop-out platform from a PCI card. Once the user was identified, the authentication software would launch the VPN client, Taylor says.

Snyder says the days of people testing VPNs on a small scale are over, and both companies and service providers are looking for integrated products with good management.

"People are saying, 'We've done our two-site VPN'," he says. "'How do we do 100 sites or 1,000 sites?' " ◪

Sprint,
continued from page 9

to users, Stratecast's Smith says.

"The real question is whether they'll commit the resources to make that happcn," he says.

Lauer says Sprint has not been selling ION aggressively to businesses both because of the softswitch development issue and because the company is rolling out a network software upgrade by the end of May.

Sprint is also moving ION to support voice over ATM, which Lauer says more efficiently uses bandwidth.

Voice traffic is now using 128K bit/sec worth of bandwidth, but the upgrade will reduce that to 16K bit/sec, Lauer says.

Financial results from Sprint's ION business underscore the service's slow start: In the first nine months of 2000, ION generated $5 million in revenue (Sprint bundles fixed wireless revenue in here, too). The operating loss for ION over the same period was $458 million. In 1999, Sprint took in no ION revenue and reported an operating loss of $243 million from its ION business.

SprintLink

Sprint is also playing catch-up with its IP-based SprintLink backbone for enterprise data. The provider recently announced plans to extend SprintLink to Europe and Asia, allowing Sprint to better service its multinational enterprise customers.

Sprint currently satisfies multinational demands by buying wholesale international bandwidth from companies such as Global One and WorldCom. By operating its own international infrastructure, Sprint should be able to lower its expenses, which could translate into more competitive rates for companies.

The provider is also making a significant investment in building metropolitan-area fiber rings in 20 U.S. markets.

Until now, Sprint has leased fiber from incumbent local exchange carriers. But Sprint officials say the company can ultimately achieve better profit margins by building its own infrastructure.

Other planned SprintLink upgrades include managed network-based VPNs, voice-over-IP services and an OC-192 network upgrade. Sprint is slightly behind in the OC-192 game.

While AT&T is supporting OC-192 across the U.S., Sprint has yet to deploy its first segment. "We'll have OC-192 by mid to later this year," says Keith Paglusch, president of E-Solutions at Sprint.

Sprint is also developing a network-based IP VPN service that will offer a centralized approach to managing VPNs and faster implementation times. Rather than installing VPN equipment on customer premises, as Sprint does now, network-based VPNs are enabled by service providers through equipment in the carrier network. Currently Broadwing and Savvis are offering network-based VPN services.

Sprint customers will also be able to integrate voice over their IP VPN. Sprint will soon test Lucent voice-over-IP gear based on an agreement the two companies signed early this month.

PCS

Although Sprint has fallen behind with some of its wireline services, it is staying ahead of the game in wireless.

The company will start its 3G upgrades later this year, says Paul Reddick, a vice president at Sprint PCS. The wireless group is upgrading its network with Code Division Multiple Access 2000 channel cards that will be installed throughout the carrier's network. The upgrade will increase wireless data transmission speeds from 14.4K bit/sec to 144K bit/sec.

Although Sprint has fallen behind with some of its wireline services, it is staying ahead of the game in wireless.

While that's obviously a huge improvement, 144K bit/sec is generally refcrred to as 2.5G (generation two-and-a-half), says Elliot Hamilton, senior vice president at consulting firm Strategis Group. Sprint will need to hit the 3G (384K bit/sec) mark, he says.

Sprint is also readying its network to improve wireless application support. Today users can work with Sprint to make their application servers running Siebel customer relationship management software accessible via the Sprint PCS network.

Customers can also access corporate Lotus and Microsoft e-mail applications through deals Sprint PCS has with Lotus and Wireless Knowledge.

But Sprint plans to offer wireless application hosting in the near future. The company is in the proccss of integrating its wireless network with its IP network and data centers, Reddick says.

Customers will be able to host high-end applications at Sprint's data centers. Sprint PCS is using Openwave's UP.Link Servers to communicate between its wireless and IP networks, Reddick says.

By year-end, Sprint says it will offer business users several application hosting options, but would not go into software details.

Reddick says the offering will include messaging, enterprise applications and standard wireless Web content such as a stock ticker information.

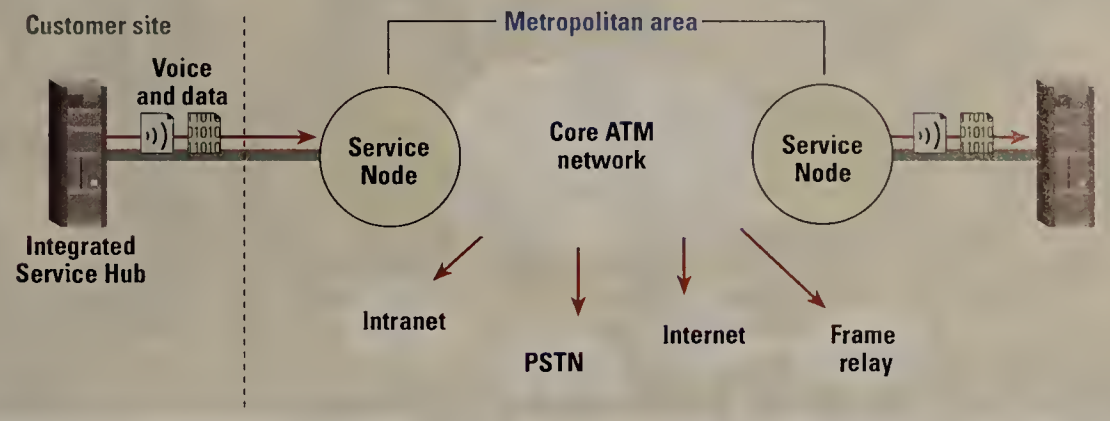
If Sprint actually rolls out a suite of enterprise application hosting services that both wireless and wireline users can securely access, the company will be ahead of competitors. AT&T has thc national wircless network to offer business users the same type of integration but has clearly stated it does not plan to offer application hosting servicc.

And WorldCom docsn't offer either. WorldCom rcsclls wireless services from companies such as Sprint PCS and is not offering application hosting services. ◪

IONizing voice and data

Sprint's ION will allow enterprise customers to transport voice and data over one connection.

1. Sprint's Integrated Service Hub sits on a customer premises. All enterprise voice and data connections terminate at the hub.
2. Voice and data travel over one of a number of last-mile access lines to a Sprint Service Node located in a metropolitan area.
3. The Service Node, which includes ATM switches, IP routers, and Web and security servers, connects to Sprint's core long-haul ATM network.
4. The core ATM network sends traffic to other ION-connected sites, or out to other networks, such as a private frame relay network, the PSTN or the Internet.



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Backspin

And you thought Napster was bad

MARK GIBBS

Well, it finally happened — Napster has been shut down. Or at least Napster has been told to shut down. As of last Monday you could still find about 9,500 users with 1.8 million MP3 files available for sharing.

What this will mean long-term for the company is uncertain. Will the deal with BMG materialize? Time will tell (although I can't figure out why BMG hasn't yet realized they've backed a lame horse in the file-sharing race).

But what I can't fathom is what Napster's executives were thinking. They had months to change the game to avoid such a decision. For a start, generalizing the Napster software to handle a wider range of file types than just MP3 files would have changed things considerably.

And while they were at it, couldn't they have improved the Napster interface? Simple things like making the search fields into combo boxes that retain past search terms.

Or how about features such as the ability to resume downloads, find near matches, sort on any columns, or, perhaps — and here's a biggie — make it so that entering multiple quotes in the search field doesn't cause the Napster client to freeze? (Nah, why take a crummy piece of code and make it stable? Didn't seem to be an issue for Microsoft.)

Anyway, as I implied in a previous column, Napster now looks much like a dinosaur — the antecedent to a whole genera of systems that are much more developed and will be harder to shut down yet provide essentially the same service.

Consider Hotline (www.bigredh.com). Hotline is like Napster on steroids, and if I were a network exec interested in the health of my enterprise network, I'd be seriously considering banning Hotline — it is not only a source of huge amounts of extra traffic, it is also a source of potential legal problems.

Hotline, unlike Napster, is rampant with real digital pirates, and it's fascinating that much of the existence of the pirated "warez" (as hackers call them) seems to be unknown or ignored by the copyright owners of the music, films and software. Perhaps that's because Hotline servers are hard to shut down, but the scope and blatancy of the piracy is staggering.

For example, you can find every single product in the Microsoft and Adobe catalogs -- even the very latest — along with passwords and unlock codes. You don't even have to look very hard. Think of a current Hollywood movie — you can find it available for download on Hotline. Hell, you can even find titles that are just about to be released!

Music, films, software, photographs, pornography -- you name it, if it is available in a digital form it can be found somewhere on Hotline.

By the way -- it is interesting that many of the Hotline sites require you to log on with a name and password to be able to download content, and for that they usually give instructions to go to some Web server and click on a banner ad which brings up a page with your logon name and password.

The reason for this is the pirates get money for the ad clicks, which highlights one of the biggest and certainly most widespread frauds on the 'Net today: ad clicks that are generated solely in pursuit of illegal content.

I'm trying to determine the scale of bogus clicks but my guess is they represent something in the region of millions of dollars per month of revenue that supports and encourages pirates.

Anyway, Hotline is only one of the Napster alternatives available. There's also Tripnosis, Gnutella, Newtella, Filetopia, Freebase, iBase, Servent, Toadnode, WinMX and probably a few others I haven't yet heard of.

To say that the illegal file-sharing cat is out of the bag is an understatement. Napster may be crawling toward its grave but its descendants are alive and well and damn nearly unstoppable. Napster, R.I.P.

Send epitaphs to nwcolumn@gibbs.com.

'NET BUZZ

The latest on the Internet industry

PAUL MCNAMARA

There's plenty of snap and crackle in Silverpop Systems.

Previously known as **Avienda Technologies,** this Atlanta start-up is trying to sweeten text-only e-mail with its Silverpop Messaging Network, which uses streaming media and XML to transform stagnant store-and-forward e-mail into a more stimulating communications channel.

How many people want all that sugar remains an open question, given the number of e-mail users and network executives who seem to prefer plain ol' Corn Flakes to whatever taste treats the messaging vendors are pitching this month.

Nevertheless, Silverpop looked like fun in a 45-minute office demonstration. Here's the short-course on how it works:

Using a Silverpop Compose Tool on the desktop, an e-mail sender creates a message featuring customized layouts, animated stationery, streaming video and other dynamic content made available by his employer or Silverpop. That content is packaged into what the company calls its **Dynamic Messaging Transfer Protocol** format and shipped using standard e-mail to a Silverpop DMTP server.

Simultaneously, an instruction set for that message is sent to the ultimate recipient or recipients inside an ordinary e-mail. When that e-mail is opened, a call is triggered to a DMTP server within the Silverpop Messaging Network, an HTTP connection is established and the content is optimized for viewing within the recipient's client. Then it's time for the show, which plays out inside the e-mail.

It's easy to see the potential for using Silverpop to communicate with customers, publish e-mail newsletters and correspond with others who you know will welcome and appreciate the song and dance. Led by **Draper Fisher Jurvetson,** the company's investors have bet $30 million on the notion that e-mail users will soon clamor for this kind of razzle-dazzle.

Maybe, but I'm not about to bet against Corn Flakes.

A company undeserving of free publicity sent a press release last week touting software that will surreptitiously record a second-by-second account of a PC user's online activities, including e-mail and chat. The company says it had originally envisioned peddling this surveillance software to businesses interested in monitoring the online shenanigans of employees and to parents intent on shielding young eyes.

Well, it turns out the majority of its customers have a different purpose in mind: Spying on a wife or husband whom they suspect of using the Internet to arrange real-life affairs.

Buzz is no **Ann Landers,** so take this advice with a grain: If you're at the point where spending $70 for software that spies on your spouse seems like a wise investment, you'd be better off skipping that purchase and putting the money in a savings account.

Divorce lawyers cost a lot more than $70 and you're definitely going to need one.

Yes, time flies when a weekly deadline looms and this chunk of newsprint stands buck naked until the fingertips produce 600 words about something at least marginally Internet-related.

But it's still hard to believe that today's column marks the 100th successful completion — OK, the 100th completion — of this appointed task.

As undoubtedly no one recalls, column No. 1 was a hard-hitting, investigative treatise on the evils of "typo Web sites," so called because their owners choose URLs that are intentional misspellings of household names. The intent is to attract accidental traffic, more often than not to porn sites. While that piece poked fun at the "alphabetically challenged" who reward the scam, reader reaction to the 98 columns in between has served to remind me that to err is journalism . . . as has a threat from my editor to take away my pundit's license should I ever again misspell Andreessen.

Next week we tuck into a fresh C-note.

Your job is to keep me honest. The address is buzz@nww.com.

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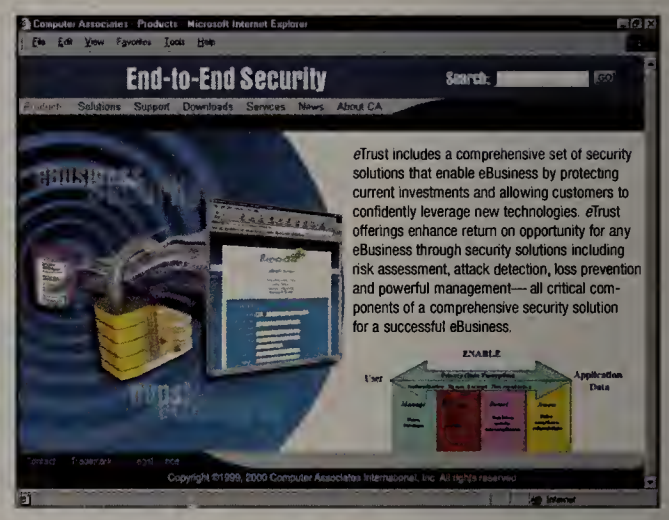

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